DOCUMENT RESUME

ED 177 763 EC 121 114

AUTHOR	Henderson, Hyrum S.
TITLE	The Development of Mediated Training Programs for Workers with the Handicapped. Final Report.
INSTITUTION	Utah State Univ., Logan.
SPONS AGENCY	Bureau of Education for the Handicapped (DHEW/OE), Washington, D.C.
PUB DATE	Nov 76
CONTRACT	OEC-74-9327
NOTE	339p.; Some print is small and may be difficult to read
EDRS PRICE	MF01/PC14 Plus Postage.
DESCRIPTORS	*Educable Mentally Handicapped; Exceptional Child Research; Higher Education; *Inservice Teacher Education; Instructional Materials; *Mainstreaming; Mentally Handicapped; Program Effectiveness; *Rural Areas; Teaching Methods
IDENTIFIERS	Mildly Handicapped

ABSTRACT

The effectiveness of two courses designed to train 96 regular classroom teachers in rural areas to teach mildly handicapped children in their classrooms was examined. The courses covered teaching methods and materials and included self instructional materials. A posttest only control group design was employed. Data were collected on four measures: a criterion referenced test covering each course, a classroom observation and recording form, and a teacher inventory. Results indicated that teachers in the experimental group made significantly fewer errors on the criterion referenced tests and used more of the recommended techniques than teachers in the control group. No significant differences were found in perceived job satisfaction or teaching effectiveness. (Among 13 appendixes are sample criterion referenced tests and rating forms.) (CL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED177763

EC

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

FINAL REPORT

ON

BEH CONTRACT OEC-74-9327

THE DEVELOPMENT OF MEDIATED TRAINING PROGRAMS FOR WORKERS WITH THE HANDICAPPED

Hyrum S. Henderson
Project Director

UTAH STATE UNIVERSITY

LOGAN, UTAH

November, 1976

Project Officer: Dr. Kenneth McLaughlin

Bureau of Education for the Handicapped

U. S. O. E.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Hyrum S. Henderson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

EC 121174

TABLE OF CONTENTS

Page

LIST OF TABLES iv

ABSTRACT vi

CHAPTER

I. INTRODUCTION 1

Problem Statement 3
Purpose and Objectives. 3
Hypotheses. 4
Definitions 5

II. REVIEW OF LITERATURE 6

Handicapped Children in Regular Classrooms. 6
Performance of Handicapped Children in Regular Classrooms 9
Education Programs in Rural Schools. 10
Inservice Teacher Training. 11
Workshops 11
Minicourses. 12
Programs and Materials 12
Inservice Training: Handicapped Children in the Regular Classroom. 13
Inservice Training: Problems in Rural Areas 16
Self-Instructional Materials 17
Preservice Training. 18
Inservice Training 22
Evaluation of Instructional Products 23
Summary 24

III. METHOD. 25

Population and Sample 25
Design of the Study 26
Materials 27
Treatment 29
Data and Instrumentation 31
Analysis of Data 34

TABLE OF CONTENTS (Continued)

Page

CHAPTER

IV. RESULTS AND DISCUSSION 35

Hypothesis 1 35
Hypothesis 2 35
Hypothesis 3 36
Hypothesis 4 37
Hypothesis 5 39
Hypothesis 6 44
Summary of the Results 52
Discussion 53
Instrumentation 53
Management of the Courses. 54
Generalizability 56
Summary of the Discussion 57

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS 58

Summary 58
Conclusions 59
Recommendations 59

BIBLIOGRAPHY 61

APPENDICES. 67

Appendix A. Demographic Data. 68
Appendix B. Table 73
Appendix C. Materials for the Courses 75
Appendix D. Criterion Referenced Test and Answer Sheet for "Teaching Exceptional Children in the Regular Classroom" 77
Appendix E. Criterion Referenced Test and Answer Sheet for "Instructional Materials: How to Analyze, Adapt, Select, and Develop" 98
Appendix F. Classroom Observation and Recording Form 116
Appendix G. Teacher Inventory 122
Appendix H. Raw Data for Criterion Referenced Tests for "Teaching Exceptional Children in the Regular Classroom" and "Instructional Materials: How to Analyze, Adapt, Select, and Develop". 126
Appendix I. Raw Data for Classroom Observation and Recording Form: Observation Section 128

TABLE OF CONTENTS (Continued)

Page

APPENDICES

Appendix J. Raw Data for Classroom Observation and Recording Form: Recording Section 131
Appendix K. Raw Data for Teacher Inventory: First Administration 136
Appendix L. Raw Data for Teacher Inventory: Second Administration 139
Appendix M. Questionnaire 142

LIST OF TABLES

Table Page

1. Combined Posttest Only Control Group Design Used in Evaluating Two Courses 26

2. Mean Interrater Relability for Pairs of Observers 33

3. Analysis of Variance of Posttest Scores on a Criterion Referenced Test for "Teaching Exceptional Children in the Regular Classroom" 36

4. Analysis of Variance of Posttest Scores on a Criterion Referenced Test for "Instructional Materials: How to Analyze, Adapt, Select, and Develop" 37

5. Analysis of Variance of the Frequency of Verbal Comments Made by Classroom Teachers on Pupil Behaviors 38

6. Analysis of Variance of Frequency of Use of Techniques Specified in "Teaching Exceptional Children in the Regular Classroom" 40

7. Analysis of Variance of Teacher Self-Ratings of Job Satisfaction After Completing "Teaching Exceptional Children in the Regular Classroom" 45

8. Analysis of Variance of Teacher Self-Ratings of Job Satisfaction After Completing "Instructional Materials: How to Analyze, Adapt, Select, and Develop" 46

9. Analysis of Variance of Teachers Self-Ratings of Effectiveness in Teaching School Subjects After Completing "Teaching Exceptional Children in the Regular Classroom" 47

10. Percentages of Students Teachers Perceived as Taught Effectively After Completing "Teaching Exceptional Children in the Regular Classroom" 49

11. Analysis of Variance of Teacher Self-Ratings of Effectiveness Teaching School Subjects After Completing "Instructional Materials: How to Analyze, Adapt, Select, and Develop" 50

12. Percentages of Students Teachers Perceived as Taught Effectively After Completing "Instructional Materials: How to Analyze, Adapt, Select, and Develop". 51

LIST OF TABLES (Continued)

Table | Page

13. The Percentage of Teacher Attrition Throughout the Course of the Research 56

14. Differences in Demographic Data on Subjects Participating in "Teaching Exceptional Children in the Regular Classroom" and "Instructional Materials: How to Analyze, Adapt, Select, and Develop". 74

ABSTRACT

The purpose of this study was to determine the effectiveness of two courses designed to train regular classroom teachers in rural areas to teach mildly handicapped children in their classroom. The courses were "Teaching Exceptional Children in the Regular Classroom" and "Instructional Materials: How to Analyze, Adapt, Select, and Develop." The materials were self-instructional and presented information on specific teaching techniques and on the evaluation and use of instructional materials.

Subjects for the study were elementary classroom teachers who worked in rural areas, had mildly handicapped children in their classroom from time to time, and volunteered to take the courses. To determine the effectiveness of the materials, a posttest only control group design was employed. Data were collected on four measures: (1) a criterion referenced test covering "Teaching Exceptional Children in the Regular Classroom," (2) a criterion referenced test covering "Instructional Materials: How to Analyze, Adapt, Select, and Develop," (3) the Classroom Observation and Recording Form and (4) the Teacher Inventory. The statistical test used was analysis of variance.

The results of this study indicated that (1) teachers in the experimental group made significantly fewer errors than teachers in the control group on the criterion referenced tests, (2) teachers in the experimental group used more of the recommended techniques than teachers in the control group, and (3) teachers in the experimental group did not perceive their satisfaction with their job and teaching effectiveness significantly different from teachers in the control group.

CHAPTER I

INTRODUCTION

School systems are faced with providing services to children having wide ranges of skill levels and educational needs. Of the children in the lower 25% of the school's population in basic academic skills, some have identified handicapping conditions, the most common being mental retardation, emotional disturbance, and learning disability. Specialized programs may be necessary to provide an appropriate education for these children.

National and state support has been given for the provision of educational services to handicapped children. P.L. 93-380, Educational Amendments of 1974, provided for federal appropriations to states to assist in establishing and expanding educational services to handicapped children, and requires the implementation of programs to provide these educational services. All states must have some form of legislation mandating the establishment of appropriate educational services for handicapped children. Districts within the state, particularly those located in rural areas, which do not have appropriate educational services for the handicapped must contract with other agencies to provide the necessary services.

Common problems faced by rural school districts in implementing programs for handicapped children have been identified (Bohrson & Gann, 1963; Charles, 1969; Swick & Henley, 1975) and include the following:

1. Because of low property valuation and low tax bases, little money is available for specialized programs for small numbers of children.

2. It is difficult to find teachers who want to work and continue working in rural areas; once they get some teaching experience, they often move to more populated areas.

3. Specialists such as psychologists, counselors, and special education teachers who are available to school programs in more populated areas are often not available in rural areas because of the small student population.

4. The facilities and equipment available to teachers in rural areas are often inadequate.

Consequently, it is difficult to provide educational services for the mildly handicapped in rural areas except within the existing regular classroom framework.

Legislation mandating appropriate education for handicapped children, coupled with inadequate resources and facilities in rural schools, suggest that alternative educational structures must be developed to educate mildly handicapped children in rural areas. A concept employed in the identification of such a structure is the "least restrictive alternative" (Educational Facilities Laboratory, 1974) which advocates educational services through which children can ". . . obtain the best education at the least distance from mainstreamed society" (p. 5). Heath (1974, p. 270), however, contends that, "Teachers are not adequately prepared to deal with individual differences of the exceptional [mildly handicapped] child in their classroom."

To facilitate the education of mildly handicapped children in rural areas, personnel of the Utah State University Special Education Department developed materials to train regular classroom teachers in instructional techniques. Christoplos (1973) noted some specific techniques which would ease the work load of the regular classroom teacher when educating exceptional children: task analysis, record keeping procedures, and peer tutoring. Further, Budoff (1971) indicated that classroom teachers needed a better understanding of the role of individualized instruction in the classroom. These are some of the techniques incorporated into the instructional materials.

To train rural teachers in these particular skills, a self-instructional inservice approach was designed, alleviating the need for direct instruction by university personnel. Self-instructional materials have been shown to be effective on both a pre-service (McElhatten & Klopfer, 1974; Merwin, 1973) and an inservice basis (Hargiss, 1967; Lysaught, 1969). The self-instructional materials which were developed were presented in two courses, "Teaching Exceptional Children in the Regular Classroom" and "Instructional Materials: How to Analyze, Adapt, Select, and Develop." It was not known, however, if the materials for the two courses as they were designed would be effective in training regular classroom teachers in the specified skills.

Problem Statement

The problem, then, is that there is a lack of information concerning the effectiveness of two courses designed for the training of regular classroom teachers in rural areas to teach mildly handicapped children in their classrooms. The two courses are "Teaching Exceptional Children in the Regular Classroom" and "Instructional Materials: How to Analyze, Adapt, Select, and Develop."

Purpose and Objectives

The purpose of this study is to determine the effectiveness of materials designed to train regular classroom teachers in rural areas to work with mildly handicapped children.

To accomplish this purpose, two objectives have been identified. The first objective is to test the acquisition of information by classroom teachers being trained with the instructional materials for two courses. The second objective is to test the application by the teachers of the specified skills in the classroom setting.

Hypotheses

It was hypothesized that:

1. There would be no significant difference between the mean scores of the experimental group and the control group on a criterion referenced objective test covering the information presented in the instructional materials for "Teaching Exceptional Children in the Regular Classroom."
2. There would be no significant difference between the mean scores of the experimental group and the control group on a criterion referenced objective test covering the information presented in the instructional materials for "Instructional Materials: How to Analyze, Adapt, Select, and Develop."
3. There would be no significant difference between the mean frequencies of the experimental group and the control group on teacher response to pupil behaviors as observed using the Classroom Observation and Recording Form.
4. There would be no significant difference between the mean frequencies of the experimental group and the control group in application of designated materials in the classroom as observed using the Classroom Observation and Recording Form.
5. There would be no significant difference between the mean scores of the experimental group and the control group on self-ratings of job satisfaction using the Teacher Inventory.
6. There would be no significant difference between mean scores of the experimental group and the control group on self-ratings of teaching

effectiveness using the Teacher Inventory.

Definitions

For the purpose of this study, the following terms have been defined:

1. Mildly handicapped, handicapped, and educable mentally retarded refer to the population of children deficient in basic academic skills who may be placed in regular classrooms for instructional purposes.

2. Rural area refers to locations in the western states with an average population density of less than five people per square mile.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this review of literature is to provide information on inservice training for regular classroom teachers in rural areas who may work with handicapped children. Recent judicial and legislative decisions regarding the rights of handicapped children to public education have created a need for inservice training, particularly in rural areas. Traditional models of inservice training, such as workshops and mini-courses, provide instruction to teachers, but are often inconvenient for use in rural areas. An alternative to the use of traditional inservice models is the use of self-instructional materials. The use of these materials with classroom teachers in rural areas needs to be evaluated to determine the effectiveness of the approach in the provision of services. The review of literature has been limited to the specific categories of: (1) handicapped children in regular classrooms, (2) inservice teacher training, (3) self-instructional materials, and (4) evaluation of instructional products.

Handicapped Children in Regular Classrooms

The right of all handicapped children to appropriate services has recently been established in education. This right has been defined through judicial and legislative action, and specific implementation procedures related to educational programs have been identified. The judicial system has established the legal basis for the provision of educational services to handicapped children.

One of the important legal issues decided by the courts was the right of handicapped children to a publicly supported education. In 1972, the following statement was issued in the Mills vs. Board of Education of District of Columbia case:

> That no child eligible for a publicly supported education in the District of Columbia public schools shall be excluded from a regular public school assignment ... unless such child is provided: (a) adequate alternative educational services suited to the child's needs, which may include special education or tuition grants ... (Abeson & Bolick, 1974, p. 2).

In the case of the Maryland Association for Retarded Children vs. the State of Maryland, also cited by Abeson and Bolick (1974), the court established that Maryland law guarantees free education to handicapped children.

In addition to legal precedents supporting the rights of the handicapped to public education, legislation has been passed mandating the establishment of educational programs (Abeson, 1972). States are establishing laws which contain policies mandating the education of all handicapped children as well as setting dates for compliance with the law (Abeson, 1974). Abeson also reported that this legislation may specify that handicapped children be placed in programs as similar to those of the normal student population as possible. This may be monitored through due process provisions stipulated at both the state and federal levels to guarantee handicapped children the right to an equal and appropriate education.

Appropriate educational services for handicapped children have been specified through both judicial and legislative action. Abeson and Bolick (1974) have cited several court cases where school districts have been ordered to pay for alternative schooling when it could be documented that the student's needs were better met in the alternative setting. It was also established in the 1973 case of Lebanks vs. Spears that

"... placement in regular public school class with the appropriate support services is preferable to placement in special public school class ..." (President's Committee, no date, p. 14). This was also confirmed in two other cases (Pennsylvania Association for Retarded Children vs. the Commonwealth of Pennsylvania and Mills vs. Board of Education of District of Columbia). As stated by Ogg (1973), handicapped children have the right to the least restrictive or most normal alternative in the educational setting.

Federal legislation has also spelled out the rights of handicapped children to an education in the least restrictive setting. Abeson (1974) reported that P.L. 93-112, the Rehabilitation Act of 1973, provides that all school districts receiving federal monies may not discriminate against handicapped children. P.L. 93-380, Educational Amendments of 1974, specifies that states must develop a plan to be approved by the U.S. Commissioner of Education for the provision of equal educational opportunities for handicapped children (Abeson, Bolick, & Hass, 1975). In addition, P.L. 93-380 specifies that handicapped children be placed in the least restrictive educational environment.

The least restrictive environment has been defined as placement within a general educational system where the best education can be obtained at the least distance from mainstream society (Educational Facilities Laboratory, 1974). Within this structure, regular class placement with support services is preferable to placement in special public school classes which is preferable to institutionalization (Kreinberg & Chow, 1973; President's Committee, no date). This structure indicates a movement towards placement of handicapped children in the regular classroom.

Performance of handicapped children in regular classrooms. The effectiveness of providing educational services for handicapped children in regular classes has been noted in the areas of social and academic skills. Gampel, Gottlieb, and Harrison (1973) reported:

> The present data indicate that integrated class placement provides a milieu in which the classroom behaviors of EMR [educable mentally retarded] children are more similar to those of children who are not labeled as retarded than to those who are (p. 13).

Iano (1972) supported this position, adding that "... there is little evidence that special class placement benefits [the mildly handicapped]" (p. 167). In addition, Iano stated that alternatives to special class placement point to enrollment of handicapped children in the general education program.

Some research has shown that handicapped children who are enrolled in regular education classrooms exhibit more acceptable social behavior than those who are segregated in special classes. Gottlieb and others (1973) found that retarded children enrolled in a regular classroom for one year exhibited more pro-social behavior than peers in segregated classrooms. Gampel et al (1973) reported higher incidences of hostile, aggressive behaviors among EMR children in segregated classes than among integrated EMR children. Mainstreaming handicapped children, then, may improve social behavior in classroom settings.

In addition to social behavior, there are some data to support the fact that the academic performance of handicapped children can be improved when the children are placed in regular classrooms. Iano (1972) reported that, consistently, "... regular class educable retarded achieve as well as or better than special class educable retarded" (p. 171). When reporting math and reading scores for handicapped children enrolled in regular classes, Fountain Valley School District found that actual student performance exceeded the academic growth expectations set for the students (Handicapped Children, 1972). Budoff (1971) and Hammons (1972) have concurred that handicapped children who are in regular classes can make the same or larger academic gains as those who are segregated.

Education programs in rural schools. It becomes the responsibility of the local education agency (the school district) to implement programs for handicapped children in compliance with state and federal regulations, including placing handicapped children in regular classes. Common problems faced by school districts in rural areas when implementing such programs include limited resources, inadequate facilities, and poor instructional quality. Financial resources available to rural schools are frequently limited. According to Swick and Henley (1975), they do not receive their proportionate share of federal funds for educational services and many have low tax valuation or excessive costs per pupil (Bohrson & Gann, 1963). Bohrson and Gann also reported that many rural schools are more than 25 years old, limiting program expansion for lack of space. Swick and Henley (1975) noted that many rural schools are unable to acquire equipment and materials which are common to schools in urban areas.

In addition, Swick and Henley (1975) reported that rural schools have a difficult time maintaining quality instructional programs. Funds for programs for handicapped children are often available only on a categorical basis. Glenn and Summers (1975) pointed out that there are fewer handicapped children in rural schools, thus generating less funds for programs and providing fewer personnel who are trained to work with the handicapped. Charles (1969) found that one of the major problems of rural schools was the hiring of qualified teachers. Morrey (1973) noted that the state of

Idaho did not serve the needs of its handicapped children in rural areas because of a lack of trained professionals who resided in the area.

Few regular classroom teachers in rural areas are trained to provide educational services to handicapped children enrolled in their classes. John Ryor (1976), president of the National Education Association, stated that the trend towards mainstreaming was good, but support services and training for the regular classroom teacher were needed. Novotny (1974) stated, "Teachers have expressed a need for special education supportive help services, behavior modification techniques, and courses in remedial reading, social-emotional problems, and educational programming" (p. 14-15). Novotny and Budoff (1971) found that inservice training produced changes in teacher behavior when implementing programs for handicapped children in regular classes.

Inservice Teacher Training

Faced with the problem of providing services for handicapped children, classroom teachers have expressed a need for inservice training (Adams, 1971). Techniques used to provide the training are varied. Major variations include: (1) workshops, (2) minicourses, and (3) programs and materials.

Workshops. Workshops have frequently been used to provide inservice training for teachers. A workshop frequently involves a group of teachers and a trainer who meet in a selected location for a specified block of time. The trainer provides the instruction, and both the trainer and the teachers return to their original locations. This approach involves the travel of the teachers and/or trainer, often making follow-up on instruction difficult.

Bosco and others (1975) reported using a workshop approach to develop individualized learning and teaching practices. The workshop was individualized, based on personal goals, and a discovery learning technique was employed. The AMIDS Inservice Teacher Training Workshops (1973) used filmstrips to provide instruction to participants in the workshop. A summer workshop was instituted for social studies teachers in a small school district (Haan, 1966) which was followed by additional meetings and materials during the school year. In 1972, Boyce used workshops to train teachers in race and poverty. One of the groups of teachers lived in a ghetto for ten days while the other group received training in a classroom setting. When the initial training was completed, workshops were again used for the development of units on race and poverty.

Minicourses. Minicourses are often used as a method of providing inservice training to classroom teachers. Borg (1971, 1973) used minicourses to provide instruction to classroom teachers. The minicourse was defined as a ". . . self contained package of materials designed to train teachers to use specific teaching skills" (p. 15). The use of minicourses, as described by Borg (1971), involved the teacher viewing a film of the specific, desired behavior; planning and teaching a lesson; evaluating a video-tape of the lesson; and revising and reteaching the lesson. The minicourses were also used by Maddox and others (1970) and Stowitschek and Hofmeister (1974) to provide training to teachers.

Programs and materials. In addition to workshops and minicourses, inservice training may be presented in class-oriented approaches such as extension courses, lectures, and practicum (Description of Innovative Teaching Programs, 1973; Heath, 1974). These may be used in isolation, or a combination of the approaches may be utilized. Some combinations include coursework and practicum, workshops and follow-up field training, and seminar meetings and practicum.

To facilitate instruction within these varied approaches to inservice training, a variety of media (including both hardware and software) have been used. These include slide-tape programs with programmed workbooks, simulation games, and video tape (Directory of CITH Training Materials, 1974). In another description of training materials (Description of Innovative Teaching Programs, 1973), computer assisted instruction, multi media programmed instruction, and films were al[illegible]ed as training devices. Dagne (1968) provided inservice instructi[illegible] classroom teachers using televised lessons followed by seminars.

Inservice training: handicapped children in the regular classroom. Several inservice models and instructional techniques were introduced that have been used in the inservice training of classroom teachers. Some of these have been applied directly to training regular classroom teachers to work with handicapped children in their classrooms. In addition, some of the techniques have been used to train teachers in rural areas to work with handicapped children.

Some inservice programs have been developed to train regular classroom teachers in techniques for educating handicapped children in their classroom. Shaw and Shaw (1972) developed a model for maintaining handicapped children in the regular classroom. They suggested that special services be unavailable to the teacher, although classroom specialists would be available to consult with the teacher. The inservice training would be centered around "in-class" problems. When such a problem occurred, the teacher would consult with the specialist to find an "in-class" solution. This inservice model was not field tested.

In some cases, coursework was combined with practicum experience in the training of regular classroom teachers. Yates (1973) combined approximately 100 hours of instruction with a laboratory/experiential approach. He used this technique with 40 regular classroom teachers who were divided into treatment and control groups. The teachers were pretested and posttested using the following instruments: Dogmatism Scale Form E, Critical Thinking Appraisal, Special Education Information Questionnaire, Adjective Self Description, and Classroom Integration Inventory. There was a significant difference in the amount of information about special education obtained by the experimental group ($p=.0023$). In a similar study, Farrer and Guest (1970) combined seminars and practicum experience to train regular classroom teachers and aides to teach handicapped children. Pretest and posttest IQ and achievement test scores were collected on the children. Using the t-test to test for significant differences, these results were noted: (1) handicapped, integrated fourth graders made significant gains on the Metropolitan Achievement Test ($p<.05$) at the field test site; and (2) the IQ scores increased significantly ($p<.01$) in fourth and fifth graders when the trained teachers and aides worked in rural school classrooms.

Another inservice format used to train regular classroom teachers to instruct handicapped students involved training in specific techniques (Bradfield, Brown, Kaplan, Rickert, and Stannard, 1973). These techniques included precision teaching, individualized instruction, reinforcement, and cross-age tutoring. Three EMR and three educationally handicapped children were enrolled in regular third grade classes. As a result of the teacher training, it was reported that the special education child made greater academic and attitudinal progress than his counterpart in the special class.

Lombardi (1975) used an intensive summer workshop with follow-up during the academic school year to train classroom teachers to instruct handicapped children in the regular classroom. The following participants were randomly selected for the program: 2 administrators, 13 regular teachers, 7 special class teachers, 3 aides, and 3 students. The training involved a six week summer practice workshop in a camp setting. During the next school year, follow-up activities included home based integration projects, group encounters, workshops, a newsletter, and two symposiums. No data were reported on the effectiveness of the program.

Johnson and Radius (1974) conducted an inservice training program for regular classroom teachers who had mainstreamed students. The program consisted of 30 hours of presentations related to assessment and educational planning. They found that at least 10 weeks were needed to implement changes in the classroom in the areas of academic management, behavior management, and communications. A Likert scale was used to rate the class; 75% of the teachers found the class interesting, useful, and informative.

In an arrangement between a consortium of 53 school districts and itself, Idaho State University developed an inservice program to train residents of rural areas as educators (Teachers for the Rural World, 1970). The program involved 20 students who used programmed instructional materials, practicum experience, and coursework to work towards a standard teaching certificate. Although no data were presented, the overall results of the project were positive.

Other inservice training has been designed specifically for training regular classroom teachers in rural areas to teach handicapped children. Morrey (1973) found that there was a " ...lack of services for handicapped individuals in rural areas due to the non-availability of trained professionals who live and work in rural settings" (p. 2). To provide a solution for this problem, he selected teachers who (1) had experience or training in education, (2) expressed interest in facilitating the education of the handicapped, (3) were residents of rural areas where the program was to be implemented, and (4) had a willingness to work for the Child Development Center. The teachers were given a 4 to 6 week course with 2 hours of academic instruction and 4 hours of practicum each day. They were taught task analysis, prescriptive teaching, precision teaching, and behavior modification skills. Available data on two separate groups of teachers who were trained indicated that, on a criterion referenced test with a passing criterion of 90%, 83% of the exams had to be retaken in the first group (three teachers) and only 22% of the exams had to be retaken in the second group (three teachers). No further data analyses were reported.

Carlson and Potter (1972) utilized an engineered classroom concept to train rural elementary teachers to meet the needs of handicapped children in their classrooms. They used a three phase program to train the teachers: (1) 5 inexperienced teachers were trained through on-campus practicum and seminar instruction for one semester in an engineered classroom model; (2) the trained inexperienced teachers replaced 5 experienced teachers who received the same training as in Phase I; and (3) both groups of teachers returned to campus to develop programs for the classrooms served during the study. When responding to a questionnaire, 100% of the participants felt they were now more confident in working with exceptional children.

Inservice training: problems in rural areas. Some barriers to the provision of inservice training to rural teachers have been noted. The teacher's average work week was computed at 47.3 hours per week. The inservice training may interfere with other, preferred extracurricular activities. The cost of inservice training may cause teachers to ignore inservice opportunities. In addition, it was noted that teachers, especially those in rural areas, may have to travel long distances to get to meeting centers (Inservice Education, 1966). An alternative inservice model for teachers in rural areas which may alleviate some of these problems is the use of self-instructional materials.

Several examples of inservice training models have been reviewed. The models did not compensate for many of the instructional needs and problems found with inservice training in rural areas. Other models are available and new alternatives are being explored. When describing inservice training needs for the next decade, Edelfelt (1974) stated that ". . . the teacher center concept, minicourses, protocol materials, inservice packages and modules, and other experiments in inservice education are developing" (p. 251-252). One such alternative is the use of self-instructional materials.

Self-Instructional Materials

Self-instructional materials are designed to provide all the stimuli needed to teach the skill to the learner. The materials become the instructor. These materials are usually packaged in some manner, whether it be a book or workbook, slide-tape program, film, or combination of instructional techniques. Self-instructional materials have many advantages and have been used in both preservice and inservice instruction.

Tyler (1973) advocated the use of training packages for both preservice and inservice training. When defining a training package, he stated, "A training package can be broadly conceived as a self-contained instructional unit, which contains all necessary directions and materials to give an individual specific skills in a selected area of instruction" (p. 405). Tyler cited two other advantages to training packages: (1) more students will demonstrate mastery of skills because only a particular set of skills or subskills are presented, and (2) teachers can train other teachers with training packages. Kassay (1969) noted that instructional packages allow for individual learning rates. He added that properly designed instructional systems are capable of effective teaching, allowing the learner to be self sufficient and the teacher to manage the instructional environment.

Other advantages of self-instructional packages have been identified. They are self-paced; the learner can work through them at his own pace, using only portions of the package which he needs (Johnson, 1971; Johnson & Johnson, 1973; Smith, 1974). The materials are portable, exchangeable, replicable and modifiable (Johnson, 1971). Johnson also noted that the format of self-instructional materials is adaptable and can be applied to any content area. Several formats have been used to provide instruction on both a preservice and an inservice level.

Preservice training. Self-instructional materials have been used to provide a variety of training experiences. A self-instructional course was developed for a preservice engineering course (Alexander, 1972). The materials consisted of programmed units with self assessment tests and end-of-unit tests. No data were reported on the effectiveness of the units. Green and others (1970a, 1970b, 1970c) developed self-instructional materials for the areas of electricity, welding, and plastics. The electricity course consisted of a slide-tape program with demonstration kits. The average gain on a field test of the materials was 46% of the total possible correct answers between a pretest and a posttest. Demonstration films, programmed text, practice, and self evaluation checklists were used in the welding course. In this course, the class members learned new welding skills, 85% of the class learned 83% of the safety features, and the class had a positive attitude towards the course. The materials for the plastics course consisted of demonstration films and a programmed instruction book. It was reported that 80% of the students met 97% of the specified objectives. A programmed self-instructional workbook was used to present information on two sections of incinerator care (The Incinerator, 1973a, 1973b). No data were reported on the effectiveness of the programs. Finch (1972) used three self-instructional approaches in teaching automotive problem solving: (1) an equipment oriented approach, (2) a textbook oriented approach, and (3) a programmed instruction approach. No significant differences were noted between the three groups on a knowledge exam, although the equipment oriented group scored significantly higher on a performance examination.

The medical field has used self-instructional materials on a preservice level for training students in various techniques. Tegtmeyer, Keats, Pullen, and Langman (1974) used a combination of self-instructional modules and unstructured discussions to teach the effects of x-ray on various anatomical structures. The introductory session was taught by an instructor because it "... helps establish rapport and provides students with fundamental background" (p. 455). The program consisted of viewing films, responding to written materials, and participating in the discussion. Tegtmeyer et al reported that students responded positively to the course.

Fiel and Ways (1972) developed multi-media self-instructional modules to teach five units: venipuncture, hemoglobin determination, packed cell volume determination, blood film preparation, and reticulocyte count. Student performance ranged from a mean of 89% on one unit to a mean of 95% with an overall mean of 93%. It was reported that this overall mean was well over the minimum level of performance set by the faculty.

Strittler, Burford, Johnson, and Talbert (1973) used self-instructional materials to teach skills within the areas of obstetrics/ gynocology and pharmacology. Student performance was measured by scores achieved on the National Board of Medical Examiners (NBME) test. Students taught by the self-instructional methods at University of North Carolina scored significantly higher on the NBME (p=.01) than those trained under other approaches.

Self-instructional materials do not always produce a difference in student performance when compared to classroom instruction. In teaching psychodiagnosis and observation through video tapes, Suess (1973) reported no significant differences in the increase of observational and diagnostic skills between students exposed to the traditional approach and students using the self-instructional approach. Kahn, Conklin, and Glover (1973) reported no significant difference when teaching microscopic anatomy through self-instructional materials as opposed to the traditional approach. They did, however, report that the self-instructional approach used one third of the usual faculty contact time when compared with the traditional approach.

When traditional instruction, self-instruction utilizing a linear programmed sequence, 8mm film, and programmed laboratory exercises, and no instruction were compared in nursing education, Lysaught (1969) found no significant differences in posttest means. However, "In terms of both teacher and student time, the self-instructional approach was far more efficient, with the combined savings being used to classroom advantage in covering more areas than were formerly dealt with in the course" (p. 23).

Preservice self-instructional materials have been used with students in the field of education. McElhatten and Klopfer (1974) used texts, journals, filmloops and filmstrips, written exercises, and laboratory exercises on a self-instructional basis to teach chemistry to preservice elementary education majors. An instructor or lab assistant was available 16 hours per week to help with laboratory work. When posttesting the students using the Science Content Test, the authors found that there were no scores below 60% and that 70% of the participants scored 80% or better on the test. The preparation of self-instructional kits by students in science methods classes to teach specific science concepts was suggested by Heimler and Cunningham (1972). The kits were used with pupils and critiqued, but no data were reported on the effectiveness of the approach in teaching science methods.

Some self-instructional materials have been developed for the discipline of music. In 1968, Sidnell used self-instructional drill materials to teach score reading to student conductors. He used music education majors for his subjects. Both groups improved in performance, but Sidnell reported a gain at the .05 level of significance in favor of students who used the programmed approach. Hargiss (1967) taught elementary teachers basic music therapy through self-instructional materials. He found that programming was more efficient for learning the required skills than the traditional approach.

Merwin (1973) reported the use of self-instructional modules for preservice social studies teacher trainees. One group of students used the self-instructional modules which consisted of paper and pencil exercises with mastery tests, while the other group received traditional classroom instruction. The self-instructional module group performed significantly better on the posttest, although Merwin stated that this difference may be attributed to the novelty of the self-instructional format.

Self-instructional materials have been used in vocational, medical, and teacher training programs on a preservice level. The self-instructional approach has often been reported as successful. However, evaluative data were not always reported. In addition to preservice training, self-instructional materials have been used for training purposes for inservice programs.

Inservice training. A self-instructional program was used by Acacio, McKinley, and Scruggs (1972) for the inservice training of food service employees. Record keeping, nutrition, and purchasing skills were taught using three different instructional approaches: a self-instructional approach, a short course approach, and a no instruction group. Significant differences in performance (p=.01) were noted in both the self-instructional group and the short course group. It was also noted that participants in the self-instructional group did not like the absence of an instructor when material was unclear.

Schreiber and Markel (1973) used inservice training to provide classroom teachers with skills to produce self-instructional materials. The teachers found the process expensive in terms of production hours as compared to instructional time. A multi-media self-instructional program was developed by Rich and Loew (1973) to train classroom teachers to work with slow learners. They evaluated pupil performance, teacher attitude, and whether teachers continued in the program, but actual data were not reported.

An inservice education program was designed by Scanlon and Brown (1970) which involved the training of administrators to conduct the inservice training for their own schools. The administrators were then given six units to assist with the training of the teachers. The units consisted of educational specifications, pre-and post-tests on behavioral objectives, programmed self-instructional materials, and equipment and recommended learning settings.

Self-instructional materials have been used on both a preservice and an inservice basis. In most cases, a self-instructional approach was reported to be successful when compared to traditional instruction. Because self-instructional materials are portable and can provide for self-paced mastery of specified skills, they may provide a solution to travel and time problems related to inservice training in rural school districts. It is necessary, however, to determine the effectiveness of the self-instructional approach on each set of materials before recommending them for general use.

Evaluation of Instructional Products

Educational development involves a systematic process for developing and validating an instructional product (Hofmeister, no date). This systematic process has been called research and development (R and D). Thiagarajan, Semmel, and Semmel (1974) stated that the purpose of the validation, or summative evaluation, is to describe the effectiveness of the instructional product. The last step of the Four-D Model designed by Thiagarajan, Semmel, and Semmel is called Dissemination. At this point, materials are field tested and evaluated based on field test data prior to diffusion to the general public.

Two other validation models are frequently used in determining the effectiveness of instructional products. Borg and Gall (1971) outlined a sequence of steps to be followed in the R and D cycle. They suggested the field testing of the product prior to dissemination. Baker and Schutz (1971) supported the collection of data at all steps in the development of instructional products. They also suggested a "product tryout," or field test of the product. The collected data should be summarized for future use.

Eachur (1971) stressed the importance of determining the effectiveness of inservice training. When an instructional product or procedure is initiated, it is necessary to know whether it is effective. This need has also been pointed out by the inclusion of validation steps in the R and D process. It is necessary, then, to provide information on the effectiveness of instructional products.

Summary

In summary, then, three major areas have been reviewed. It has been reported that handicapped children are being placed in and benefiting from regular classroom instruction. State and federal legislation are mandating this placement which places a burden on the rural school teachers who are not trained to meet the needs of handicapped children. Inservice training can be effective in training teachers to work with handicapped children. One alternative for the provision of inservice training to regular classroom teachers is through the use of self-instructional materials. The self-instructional format provides a solution to the problems of extended time and travel involvements on the part of rural teachers, allowing for a more appropriate education of handicapped children in regular classes.

CHAPTER III

METHOD

Population and Sample

The target population for this study was persons who met three criteria: (1) they were teachers who were employed in rural school districts, (2) they had mildly handicapped children in their classrooms from time to time, and (3) they enrolled on their own initiative in correspondence courses through the Department of Special Education to acquire skills for teaching the mildly handicapped.

The sample for this study was teachers in sparsely populated areas in northeastern Nevada, southeastern Utah, and southwestern Wyoming. A minimum of 80 volunteers was sought; 96 teachers participated in the combined experimental and control group for the "Teaching Exceptional Children in the Regular Classroom" course. The mean age of the participants was 35 years. Of the subjects, 75% were female. The average college attendance was just over four years; 84% had received a B.S. or B.A. degree while 14% had received a M.S. or M.A. degree. The teachers averaged 8 years of teaching experience, spending an average of 4 years in their present grade (see Appendix A for demographic data).

The subjects were also requested to indicate previous training in the content areas covered in the instructional materials. The percentage of teachers who considered themselves trained in the specified content areas is listed below:

Behavior Measurement and Change	56%
Instructional Planning	33%
Criterion Referenced Testing	41%
Classroom Management	55%
Instructional Materials	45%.

The same sample was used for "Instructional Materials: How to Analyze, Adapt, Select, and Develop." Of the original 96 subjects, 72% (69 total subjects) participated in this course. There were minor differences in the two groups as shown in Table 14 (see Appendix B).

Design of the Study

A modified form of the posttest only control group design was employed as outlined by Campbell and Stanley (1963). A diagram of the design is presented in Table 1. Schools were stratified by the number of volunteer teachers from each school. The schools were then randomly assigned to the experimental and control groups by using a table of random numbers. As indicated in the diagram, the control group also received the treatment. However, because data were collected on the control group at O_2 and O_4, the design resulted in assessment before treatment so that the effect of the courses could be determined.

Table 1

Combined Posttest Only Control Group Design

Used in Evaluating Two Courses

Date			Dec.		March		May
Treatment group	R	X_A	O_1	X_B	O_3		
Control group	R		O_2	X_A	O_4	X_B	O_5

Symbol Key

R = random assignment of schools
O = observations of subjects
X = treatment
    A = Course 1: "Teaching Exceptional Children in the Regular Classroom"
    B = Course 2: "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

Although Campbell and Stanley have indicated that the posttest only control group design controls for the eight threats to internal validity, it should be noted that history, mortality, and instrument decay are possible threats to the validity of this study. To help control for the threat of history, subjects were asked to refrain from enrolling in any other courses or workshops other than mandatory inservice training offered simultaneously with participation in this research. Mortality was a threat since the subjects were all volunteers and may have felt free to drop out of the prescribed course of study at any time (Borg & Gall, 1971). However, subjects received three hours of college credit for the completion of each course. A record was kept of all subjects who did not complete the course of study. Minor differences were noted between those who dropped out of the treatment group and those who dropped out of the control group. Instrument decay will be discussed in the Data and Instrumentation section.

The use of volunteer subjects is a threat to the external validity of this design. The use of volunteers requires that any generalizations be made to volunteer populations. However, it should be noted that courses such as these are typically utilized by volunteers. It is thus practical to generalize to volunteers as they chose to take the course on a correspondence basis.

Materials. The materials used in the research were in the form of two separate courses designed to be used in sequence, the "Teaching Exceptional Children in the Regular Classroom" course preceding the "Instructional Materials: How to Analyze, Adapt, Select, and Develop" course (see Appendix C). Both courses were self-instructional, requiring the learner to read the materials and complete the assignments on the basis of the information presented.

The materials were developed in the year preceding the evaluation of the materials. Project staff wrote the materials. They were then reviewed and critiqued by both project staff and experts outside the staff. Revisions were made in the materials as indicated by staff and expert review. The materials were then used on a one-to-one basis with four classroom teachers. These teachers were requested to give verbal feedback on the materials as well as note difficult areas in the text. Once again revisions were made.

Prior to using the courses in the main field test, a pilot field test was conducted. Four teachers, other than the four referred to above, were given the materials and were asked to work through them in a procedure similar to that used in the main field test. Meetings were held to discuss the courses and provide feedback on the materials. As a result of the pilot field test, revisions were made in explanations, examples, format, and assignments. The materials were then sent to the teachers in the experimental group.

The first course, "Teaching Exceptional Children in the Regular Classroom," consisted of four units. Major content areas covered in the units were behavior modification, instructional planning (task analysis), criterion referenced testing, and classroom management. The second course, "Instructional Materials: How to Analyze, Adapt, Select, and Develop," had four units covering analysis of reading materials, adaptation of reading materials, analysis of arithmetic materials, and adaptation of arithmetic materials. In addition, information on selection and development of instructional materials was presented. The courses were designed for inservice training; the learner must be a classroom teacher with access to a student population to complete the assignments.

The materials for the teachers followed a consistent format. The instruction was presented in prose, providing examples and practice exercises for the teacher. An assignment was then made which instructed the teacher to implement the technique or procedure previously presented in the classroom. The teacher submitted the results or a description of the results of the implementation of the technique or procedure to the project staff. Upon evaluating the assignment using pre-determined criteria, the project staff returned it to the teacher. The teacher then continued to work through the instructional materials following the outlined procedure.

Treatment. Principals or supervisors with staff involved in the research were asked to read through the materials for the two courses, although they were not expected to complete the assignments. They were also instructed in their role of assisting and encouraging their staff who were involved in the research. Part of this role was to record examples of the teacher's behavior on specified variables and submit the record of the information to the project staff. Principals and supervisors were requested to sign a contract which specified their role in the research. They were paid for their participation.

In September, flyers were distributed to elementary schools in the three areas selected as field test sites. Teachers who were interested in the courses were asked to return part of the flyer. Principals of the schools or other supervisory personnel were contacted to determine their willingness to assist in the inservice training of their teachers. Schools where principals were not willing to participate were dropped from the study. Once the schools were selected, teachers were requested to sign a contract specifying their obligation in the research to earn the six credits. They were not told that it was a research project, but that it was the last stage of development of the instructional materials. The teachers were asked to fill out a demographic data form, requesting information about previous training and teaching experience.

The teachers in the experimental group were then sent the materials for course A, "Teaching Exceptional Children in the Regular Classroom." The materials were self-instructional and self-paced; however, because the field testing had to be completed in one school year, it was necessary to set time guidelines to indicate the maximum time available to the subjects for completion of assignments. Completed assignments were sent to project staff at Utah State University for evaluation and returned to the subject. Subjects who wished to communicate with project staff were advised to call and charge the call to the project. In mid-December, observations 1 and 2 (O_1 and O_2) were made for the collection of posttest data for Course A.

The experimental group received the materials for Course B in January. The control group received the materials for Course A. Both groups followed the same procedures for completion of the materials outlined above. It should be noted that the materials the control group received were revised forms of the materials used by the experimental group, based on data collected from the experimental group. In mid-March, observations 3 and 4 (O_3 and O_4) were made for the collection of posttest data on Course B.

Following the posttest, the control group received the materials for Course B. They followed the same procedures for completion of the materials as outlined. At the end of May, observation 5 (O_5) was made to collect posttest data for Course B.

Data and Instrumentation

Four measures were used to collect the data for this research: two criterion referenced tests, the Classroom Observation and Recording Form, and the Teacher Inventory. The measures were developed to correspond with the objectives of the courses, measuring the knowledge and application of those skills to be learned during the course of instruction.

Criterion referenced tests were developed for the measurement of the knowledge acquired by the subjects through participation in the two courses. An objective test was written for each course, using multiple choice and matching formats. The test items covered the objectives stated for instructional planning (task analysis), criterion referenced testing, and classroom management were covered in the test for Course A (See Appendix D). The Course B tests covered the analysis, adaptation, selection, and development of instructional materials (See Appendix E). The criterion referenced tests for Course A was used to collect posttest data on observations 1 and 2 (0_1 and 0_2). This test was also administered to the control group on observation 4 (0_4). The criterion referenced test for Course B was used to collect posttest data on observations 3 and 4 (0_3 and 0_4). In addition, this test was administered to the control group on observation 5 (0_5).

Content validity of the criterion referenced tests was established through project staff review. Staff members were given copies of the materials and of the tests. They were asked to read through the materials and evaluate (1) the relationship of the tests items to the text and (2) the correct answer choice(s) for each item. Discrepancies in answer choices chosen were discussed, and revisions were made in the items to resolve those discrepancies.

The reliability of the criterion referenced tests was established using the Spearman Brown prophecy formula (Anastasi, 1961, p. 122). Although the use of traditional correlation coefficients to determine the reliability of criterion referenced tests has been debated, the tests used in this study yielded no zero scores or ceiling scores and a dispersion existed among the scores. Using the split half technique, the reliability for the criterion referenced test covering "Teaching Exceptional Children in the Regular Classroom" was .72. The reliability for the criterion referenced test covering "Instructional Materials: How to Analyze, Adapt, Select, and Develop" was .92.

To measure the actual use of techniques recommended in the materials for "Teaching Exceptional Children in the Regulat Classroom," a Classroom Observation and Recording Form was developed (see Appendix F). The form was used by raters to observe and record the application of assigned skills in the classroom. The observation was broken into two sections. The first was an observation of teacher's reactions to student behavior. The second was an analysis of the following materials: (1) the use of graphs for data collection, (2) the availability of reinforcers, (3) the use of a contingency table, (4) specification of instructional plans, (5) the use of teacher-developed criterion referenced tests, (6) the use of individual student assignment folders, (7) a filing system for supplemental materials, (8) a daily schedule chart, and (9) the use of classroom tutors. Criteria for evaluating the materials are listed in the instrument. The rater asked the teacher for copies of the materials to be analyzed; those were evaluated using pre-determined criteria noted on the instrument.

Six raters were trained in the use of the Classroom Observation and Recording Form prior to making observations. The training consisted of explanations on how to use the form and practice using it with videotaped classrooms and in actual classroom settings not included in the study population. At least 25% of the actual observatons were made by two people who worked simultaneously, but made independent observations. Interrater reliability was established prior to field observations for each pair of observers and during field observations. Table 2 depicts the levels of interrater reliability of pairs of observers. Observations took approximately one hour.

Table 2

Mean Interrater Reliability

for Pairs of Observers

	Pair 1	Pair 2	Pair 3
Field Observations	0.9539	0.8953	0.9326

Content validity of the Classroom Observation and Recording Form was also established through project staff review. Staff members were given copies of the materials for "Teaching Exceptional Children in the Regular Classroom" and of the instrument. They were asked to evaluate whether all skills designated for observation were required of the teachers in the instructional materials. Discrepancies were discussed and revisions made on the basis of staff recommendations.

The fourth instrument, the Teacher Inventory, was designed for self-ratings by the teachers of their satisfaction and effectiveness in the classroom (see Appendix G). Areas related to satisfaction and effectiveness such as attitudes towards the class of students, faculty, and administrators; and relative teaching effectiveness in different subject matter areas were included. Following each area listed, a scale was provided for the teacher to mark the rating for that area. Subjects were asked to respond by assigning a value from 1 to 5 or from 1 to 6, with either 5 or 6 indicating maximum satisfaction or effectiveness. The Teacher Inventory was used for the collection of posttest data on all observations (O_1, O_2, O_3, O_4, and O_5).

Instrument decay may have been a threat to the internal validity of this research, particularly in the actual classroom observation. Raters were not able to observe "blind." To help control for this threat, interrater reliability among all six observers was established prior to the observations. Checks were made on the reliability between pairs of observers making simultaneous, but independent observations. Raters did not observe the same subjects, helping to eliminate the problems of "expected" results. The criterion referenced tests and the Teacher Inventory were not changed between administrations, controlling for instrument decay due to a change in the instrument.

Analysis of Data

The data collected were posttest scores for each teacher on four measures. The measures included two criterion referenced tests, the Classroom Observation and Recording Form, and the Teacher Inventory. The statistical test used was the analysis of variance for unequal groups computed on mean scores for the schools.

The following analyses were carried out: (1) the means of O_1 and O_2 were compared; and (2) the means of O_3 and O_4 were compared. (See Table 1, p. 26, for observation schedule.)

CHAPTER IV

RESULTS AND DISCUSSION

Results

Self-instructional materials were used to train regular classroom teachers in rural areas to work with mildly handicapped children. Data were collected to determine the effectiveness of the materials. The results of the analysis of data are reported for the hypotheses as they were presented in Chapter II.

Hypothesis 1. It was hypothesized that there would be no significant difference between the mean scores of the experimental group and the control group on a criterion referenced objective test covering the information presented in the instructional materials for "Teaching Exceptional Children in the Regular Classroom."

The results of the analysis of the subjects' scores on the criterion referenced objective test are shown in Table 3 (see Appendix H for raw data). Since questions on the test could have one or more correct choices, answers were analyzed for errors of commission (incorrect answers selected) and errors of omission (correct answers not selected). As can be seen in Table 3, teachers in the experimental group made significantly less errors than teachers in the control group ($p < .001$).

Hypothesis 2. It was hypothesized that there would be no significant difference between the mean scores of the experimental group and the control group on a criterion referenced objective test covering the information presented in the instructional materials for "Instructional Materials: How to Analyze, Adapt, Select, and Develop."

Table 3

Analysis of Variance of Posttest Scores on a Criterion Referenced Test for "Teaching Exceptional Children in the Regular Classroom"

Variable	Variance	df	MS	F
Errors of Commission	between	1	4,150.8750	27.801*
	within	29	149.3069	
Errors of Omission	between	1	3,866.3975	98.490*
	within	29	39.2566	
Total Correct	between	1	15,955.8824	81.521*
	within	29	195.7282	

* $p < .001$

The results of the analysis of subjects' scores on the criterion referenced tests are shown in Table 4 (see Appendix H for raw data). As in the test for "Teaching Exceptional Children in the Regular Classroom," there were one or more correct choices per question. The analysis of teachers' answers included errors of commission and errors of omission. As can be seen in Table 4, teachers in the experimental group made significantly less errors than teachers in the control group ($p < .001$ and $p < .005$, respectively).

Hypothesis 3. It was hypothesized that there would be no significant difference between the mean frequencies of the experimental group and the control group on teacher response to pupil behaviors as observed using the Classroom Observation and Recording Form.

Table 4

Analysis of Variance of Pottest Scores on a Criterion Referenced Test for "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

Variable	Variance	df	MS	F
Errors of Commission	between within	1 29	2,188.8600 46.5957	46.976**
Errors of Omission	between within	1 29	1,734.0000 162.4348	10.675*
Total Correct	between within	1 29	7,978.9067 204.5623	39.005**

* $p < .005$
** $p < .001$

The results of the analysis of teacher response to pupil behavior are shown in Table 5 (see Appendix I for raw data). Eight variables were measured. These included: (1) positive teacher verbal response to appropriate student behavior, (2) positive teacher non-verbal response to appropriate student behavior, (3) pupil talk-outs, (4) verbal teacher response to pupil talk-outs, (5) non-verbal teacher response to talk-outs, (6) pupil out-of-seat behavior, (7) verbal teacher response to pupil out-of-seat behavior, and (8) non-verbal teacher response to pupil out-of-seat behavior. Differences between the experimental teachers and the control teachers were significant on one variable, positive teacher verbal response to appropriate student behavior ($p < .05$).

Hypothesis 4. It was hypothesized that there would be no significant differences between the mean frequencies of the experimental group and the control group in the application of designated materials in the classroom as observed using the Classroom Observation and Recording Form.

Table 5

Analysis of Variance of the Frequency of Responses Made by Classroom Teachers to Pupil Behaviors

Variable	Variance	df	MS	F
Positive Teacher Verbal Response to Appropriate Behavior	Between	1	0.1811	4.149*
	Within	29	0.0436	
Positive Non-Verbal Response to Appropriate Behavior	Between	1	0.0000	0.003
	Within	29	0.0014	
Pupil Talk-outs	Between	1	14,914.8520	0.860
	Within	29	17,342.9757	
Verbal response to pupil talk-outs	Between	1	4.4512	
	Within	29	23.6905	0.188
Non-verbal response to pupil talk-outs	Between	1	0.1169	0.234
	Within	29	0.4991	
Pupil out-of-seat	Between	1	183.5485	0.427
	Within	29	429.8866	
Verbal response to pupil out-of-seat	Between	1	0.9138	0.416
	Within	29	2.1969	
Non-verbal response to pupil out-of-seat	Between	1	0.1732	0.403
	Within	29	0.4301	

* $p < .05$

Data were collected on 47 variables on the Recording section of the Classroom Observation and Recording Form. These variables were classified into nine major categories: (1) tutors, (2) graphs, (3) reinforcers, (4) contingency tables, (5) instructional plans, (6) student by task matrices, (7) daily routine matrices, (8) filing systems, and (9) student assignment folders (see Appendix J for raw data). All of the variables measured under reinforcers and filing systems showed significant differences between the experimental and control teachers ($p < .05$). More experimental teachers used graphs than control teachers ($p < .01$), and used the graphs as prescribed in the instruction presented in "Teaching Exceptional Children in the Regular Classroom" ($p < .05$). When analyzing the following variables, it was found that more experimental teachers also used the specified techniques: (1) tutors: adults who were paid, (2) student by task matrices: student names on one axis, (3) daily routine matrices: student names on one axis, (4) student assignment folders: number used, (5) student assignment folders: provision for immediate checking of assignments, and (6) student assignment folders: provision for recording student progress ($p < .05$ for each listed variable). Each of these variables was significant at the .05 level with the exception of the number of student assignment folders used which was significant at the .01 level. The results for hypothesis 4 are shown in Table 6.

Hypothesis 5. It was hypothesized that there would be no significant difference between mean scores of the experimental group and the control group on self-ratings of job satisfaction using the Teacher Inventory.

The analysis of the self-ratings of the subjects on satisfaction with different aspects of their job after taking "Teaching Exceptional Children in the Regular Classroom" is shown in Table 7. Teacher satisfaction with the following seven variables was measured: (1) employment,

Table 6

Analysis of Variance of Frequency of Use of Techniques Specified in "Teaching Exceptional Children in the Regular Classroom"

Variable	Variance	df	MS	F
Tutors: Volunteer Adults	Between	1	0.0021	2.216
	Within	29	0.0009	
Tutors: Paid Adults	Between	1	0.0007	1.703
	Within	29	0.0004	
Tutors: Volunteer Students	Between	1	0.0002	0.018
	Within	29	0.0116	
Tutors: Paid Students	Between	1	0.0000	
	Within	29	0.0000	
Tutor time: Volunteer Adults	Between	1	0.4827	1.271
	Within	29	0.3799	
Tutor time: Paid Adults	Between	1	64.3185	6.165*
	Within	29	10.4327	
Tutor time: Volunteer Students	Between	1	0.3219	0.174
	Within	29	1.8534	
Tutor time: Paid Students	Between	1	0.0000	
	Within	29	0.0000	
Graphs: Total Used for Baseline	Between	1	0.6813	8.753**
	Within	29	0.0778	
Graphs: Correct Behavior Statement	Between	1	0.2730	4.468*
	Within	29	0.0611	
Graphs: Appropriate Measurement for Behavior	Between	1	0.3692	6.330*
	Within	29	0.0583	

Table 6 (continued)

Graphs: Units Measured on Left	Between Within	1 29	0.2183 0.0610	4.611*
Graphs: Days Listed on Bottom	Between Within	1 29	0.2108 0.0575	3.665
Graphs: Data Correctly Plotted	Between Within	1 29	0.4318 0.0609	7.095*
Graphs: Total Used Past Baseline	Between Within	1 29	0.3165 0.0418	7.578*
Graphs: Total Used Past Baseline Meeting Baseline Criteria	Between Within	1 29	0.1297 0.0367	3.532
Graphs: Vertical Line Separating Base-Line and Treatment	Between Within	1 29	0.1297 0.0367	3.532
Graphs: Baseline and Treatment Labeled	Between Within	1 29	0.1106 0.0373	2.966
Reinforcers: Total Different	Between Within	1 29	2.8951 0.4686	6.178*
Reinforcers: Used by Students	Between Within	1 29	2.8990 0.4699	6.170*
Contingency Tables: Subject Areas	Between Within	1 29	14.8946 5.9686	2.495
Contingency Tables: Number of Students	Between Within	1 29	0.0642 0.0256	2.510
Contingency Tables: Student Name on One Axis	Between Within	1 29	5.1803 2.1656	2.392

Table 6 (continued)

Contingency Tables: Contingencies Specified	Between	1	5.1803	2.392
	Within	29	2.1656	
Contingency Tables: Behavior Specified	Between	1	5.1803	2.392
	Within	29	2.1656	
Instructional Plans: Subject Areas	Between	1	9.3622	3.318
	Within	29	2.8215	
Instructional Plans: Objectives Sequenced	Between	1	9.4150	3.281
	Within	29	2.8694	
Instructional Plans: Objectives Are Behavioral	Between	1	8.3328	2.849
	Within	29	2.9245	
Instructional Plans: Mastery Criteria Specified	Between	1	8.7141	3.001
	Within	29	2.9040	
Student by Task Matrix: Number Used	Between	1	3.5549	0.615
	Within	29	5.7797	
Student by Task Matrix: Student Names on One Axis	Between	1	12.3575	4.784*
	Within	29	2.5830	
Student by Task Matrix: Objectives on One Axis	Between	1	8.3422	3.141
	Within	29	2.6559	
Student by Task Matrix: Used for Individualized Instruction	Between	1	8.4434	3.206
	Within	29	2.6333	
Daily Routine Matrix: Number Used	Between	1	25.1427	1.658
	Within	29	15.1669	

Table 6 (continued)

Daily Routine Matrix: Student Names on One Axis	Between	1	0.3525	7.533*
	Within	29	0.0468	
Daily Routine Matrix: Time Blocks Specified	Between	1	25.4706	1.679
	Within	29	15.1656	
Daily Routine Matrix: Activities Listed	Between	1	24.4816	1.609
	Within	29	15.2192	
Filing System: Number of Subject Areas	Between	1	19.4555	6.633*
	Within	29	2.9331	
Filing System: Major Headings	Between	1	15.0414	5.499*
	Within	29	2.7352	
Filing System: Materials in folders	Between	1	16.1427	5.746*
	Within	29	2.8095	
Filing System: Folders Sequenced	Between	1	12.1399	5.967*
	Within	29	2.0347	
Filing System: Folders Labeled	Between	1	17.8273	6.615*
	Within	29	2.6948	
Assignment Folders: Number Used	Between	1	0.4435	8.045*
	Within	29	0.0551	
Assignment Folders: Assignment Sheet	Between	1	0.1467	3.164
	Within	29	0.0464	
Assignment Folders: Assignment in Folder	Between	1	0.1782	4.045
	Within	29	0.0441	(0.051)
Assignment Folders: Immediate Checking	Between	1	0.1598	4.721*
	Within	29	0.0339	
Assignment Folders: Recording Work	Between	1	0.2151	5.184*
	Within	29	0.0415	

* $p < .05$
** $p < .01$

(2) students, (3) administration, (4) faculty, (5) equipment and supplies, (6) textbooks, and (7) grade level (see Appendix K for raw data). The expressed satisfaction of treatment teachers on equipment and supplies was significantly different ($p < .01$) than control teachers. Experimental teachers also expressed significantly higher satisfaction in the areas of administration and textbooks ($p < .05$). Teachers in the control group rated their satisfaction with their students significantly higher ($p < .05$) than teachers in the experimental group.

When teachers were asked to make the same ratings at the conclusion of the second course, "Instructional Materials: How to Analyze, Adapt, Select, and Develop," no significant differences were found between the experimental teachers and the control teachers (See Appendix M for raw data). These results are shown in Table 8.

Hypothesis 6. It was hypothesized that there would be no significant difference between mean scores of the experimental group and the control group on self-ratings of teacher effectiveness using the Teacher Inventory.

The results of the analysis of self-ratings in the effectivenss of teaching different subjects following the completion of "Teaching Exceptional Children in the Regular Classroom" are shown in Table 9 (see Appendix K for raw data). The teachers rated their effectiveness in teaching ten subjects: (1) reading, (2) arithmetic, (3) spelling, (4) language arts, (5) social studies, (6) health, (7) science, (8) music, (9) art, and (10) physical education. In one subject area, health, experimental teachers rated their teaching effectiveness significantly higher than control teachers ($p < .05$).

In addition to the rating of effectiveness, teachers were asked to specify the percentage of students they felt they taught effectively in each subject area. These percentages are shown in Table 10 (see Appendix

Table 7

Analysis of Variance of Teacher Self-Ratings of Job Satisfaction After Completing "Teaching Exceptional Children in the Regular Classroom"

Variable	Variance	df	MS	F
Employment	Between	1	0.2624	0.686
	Within	29	0.3825	
Students	Between	1	2.2555	-5.859*
	Within	29	0.3850	
Administration	Between	1	2.6187	4.183*
	Within	29	0.6261	
Faculty	Between	1	0.1303	0.090
	Within	29	1.4438	
Equipment and Supplies	Between	1	4.7905	7.895**
	Within	29	0.6068	
Textbooks	Between	1	3.9633	6.837*
	Within	29	0.5797	
Grade Level	Between	1	0.0847	0.054
	Within	29	1.5655	

* $p < .05$
** $p < .01$

Table 8

Analysis of Variance of Teacher Self-Ratings of Job Satisfaction After Completing "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

Variable	Variance	df	MS	F
Employment	Between Within	1 29	0.0267 1.5884	0.017
Students	Between Within	1 29	1.7067 1.0493	1.627
Administration	Between Within	1 29	0.9600 2.3304	0.412
Faculty	Between Within	1 29	1.1267 1.8884	0.597
Equipment and Supplies	Between Within	1 29	0.0267 1.4841	0.018
Textbooks	Between Within	1 29	0.9600 1.9652	0.488
Grade level	Between Within	1 29	0.1667 2.3406	0.071

Table 9

Analysis of Variance of Teachers Self-Ratings of Effectiveness in Teaching School Subjects After Completing "Teaching Exceptional Children in the Regular Classroom"

Variable	Variance	df	MS	F
Reading	Between Within	1 29	0.2994 0.4991	0.600
Arithmetic	Between Within	1 29	0.0087 0.3512	0.025
Spelling	Between Within	1 29	0.5552 0.6839	0.812
Language Arts	Between Within	1 29	0.0598 0.5385	0.111
Social Studies	Between Within	1 29	1.3284 0.6950	1.911
Health	Between Within	1 29	4.9965 0.9134	5.470*
Science	Between Within	1 29	0.0916 0.5975	0.153
Music	Between Within	1 29	1.8554 1.0306	1.800
Art	Between Within	1 29	0.9793 0.8695	1.126
Physical Education	Between Within	1 29	1.7925 1.1395	1.573
Other	Between Within	1 29	4.0565 1.9758	2.053

* $p < .05$

K for raw data). When analysis of variance was used to determine the difference between the two groups, no significant differences were found. In most cases, experimental teachers rated the percentage of students effectively taught in each subject area higher than the control group. However, both groups rated their effectivenss in spelling the same and the control group teachers rated their effectiveness in reading higher.

Teachers were asked to make the same ratings at the conclusion of the second course, "Instructional Materials: How to Analyze, Adapt, Select, and Develop." The analysis of the results is shown in Table 11. When rating their effectiveness at this time, the only subject area in which experimental teachers rated their effectiveness significantly higher than control teachers was science ($p < .05$). (See Appendix L for raw data).

When specifying the percentage of students they felt they effectively taught in each subject area, experimental teachers indicated a higher percentage of students effectively taught than control teachers in most subject areas (see Appendix L for raw data). This is shown in Table 12. Teachers in the control group indicated a slightly higher percentage of students taught effectively in social studies. When analysis of variance was used to determine any significant differences, none were found.

Table 10

Percentage of Students Teachers Perceived as Taught Effectively After Completing "Teaching Exceptional Children in the Regular Classroom"

Subject	Treatment	Control	Total Group
Reading	82%	83%	82%
Arithmetic	91%	84%	87%
Spelling	80%	80%	80%
Language Arts	81%	78%	79%
Social Studies	80%	75%	77%
Health	80%	65%	72%
Science	80%	71%	75%
Music	66%	44%	54%
Art	77%	64%	70%
Physical Education	57%	48%	52%
Other	16%	13%	14%

Table 11

Analysis of Variance of Teacher Self-Ratings of Effectiveness Teaching School Subjects After Completing "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

Variable	Variance	df	MS	F
Reading	Between	1	2.4067	2.323
	Within	29	1.0362	
Arithmetic	Between	1	1.7067	1.436
	Within	29	1.1884	
Spelling	Between	1	0.3267	0.286
	Within	29	1.1406	
Language Arts	Between	1	0.0000	0.000
	Within	29	1.1304	
Social Studies	Between	1	4.5067	3.534
	Within	29	1.3754	
Health	Between	1	1.7067	1.338
	Within	29	1.3754	
Science	Between	1	8.6400	6.537*
	Within	29	1.3217	
Music	Between	1	4.5067	2.266
	Within	29	1.9884	
Art	Between	1	2.9400	2.055
	Within	29	1.4304	
Physical Education	Between	1	1.5000	0.896
	Within	29	1.6739	
Other	Between	1	0.9600	0.563
	Within	29	1.7043	

* $p < .05$

Table 12

Percentage of Students Teachers Perceived As Taught Effectively After Completing "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

	Treatment	Control	Total Group
Reading	85%	82%	83%
Arithmetic	88%	85%	86%
Spelling	91%	80%	83%
Language	82%	79%	80%
Social Studies	78%	79%	79%
Health	78%	76%	77%
Science	74%	73%	73%
Music	82%	72%	75%
Art	83%	78%	80%
Physical Education	85%	81%	82%
Other	90%	93%	93%

Summary of the Results

The results of the data analysis may be summarized as follows:

1. Teachers in the experimental group made significantly fewer errors than teachers in the control group on a criterion referenced test for the course, "Teaching Exceptional Children in the Regular Classroom."

2. Teachers in the experimental group made significantly fewer errors than teachers in the control group on a criterion referenced test for the course, "Instructional Materials: How to Analyze, Adapt, Select, and Develop".

3. When using the Classroom Observation and Recording Form to measure eight variables related to responses made by teachers to pupil behavior, one variable, positive verbal comments, was used significantly more frequently by teachers in the experimental group than teachers in the control group.

4. To measure the application of specified materials and techniques in the classroom, 47 variables were assessed utilizing the Classroom Observation and Recording Form. Of these, 19 were used significantly more often by teachers in the experimental group.

5. When asked to rate seven variables indicating job satisfaction, teachers in the experimental group rated three significantly higher than teachers in the control group at the conclusion of the first course, "Teaching Exceptional Children in the Regular Classroom". Teachers in the control group also rated one variable significantly higher than teachers in the experimental group. There were no significant differences when the same ratings were made at the conclusion of the second course, "Instructional Materials: How to Analyze, Adapt, Select, and Develop."

6. When asked to rate teaching effectiveness in the subject areas, teachers in the experimental group rated one subject area significantly

higher than teachers in the control group at the conclusion of each course.

Discussion

Instrumentation. Three of the instruments used in the study yielded major significant differences between experimental and control teachers. These differences, however, may have been due to uncontrolled intervening variables. These variables are (1) the validity and level of reliability of the instruments, (2) measuring of personal attitude, and (3) the possible contamination on the second posttest by knowledge of the first course by the first control group.

The reliability and validity established for the two criterion referenced tests and the Classroom Observation and Recording Form was reported in Chapter III. Neither reliability nor validity was established for the Teacher Inventory. The level of relability and/or the content validity established for the instruments may have caused spurious results on the remaining three instruments.

In relation to the criterion referenced test for "Teaching Exceptional Children in the Regular Classroom," it is possible that the length of the test may have accounted for results obtained in the data analysis. Most posttesting was conducted at the end of the school day. The test took about one and one-half to two hours to administer to most teachers.

The Teacher Inventory measured personal attitudes towards satisfaction and effectiveness in teaching. Consistent reliability on this type of instrument would be difficult to attain as teacher attitudes may vary from day to day. Significant differences were noted in one subject area at each administration of the instrument, health and science respectively. Since the instructional materials did not cover either subject area, these differences may have been chance occurrences.

Another variable which may have affected the results of the study is the possibility that the format and content of the first course, "Teaching Exceptional Children in the Regular Classroom," may have led control teachers to answer questions correctly on the posttest for the second course. The control teachers received the first course after the posttest data were collected, but prior to the collection of data following the second course. The terminology and procedures for evaluating instruction were similar in the two courses. In addition, both tests were constructed using the same format. These may have provided cues for answering questions on the posttest for the second course.

Management of the courses. The courses were managed by project staff and school principals. Project staff were responsible for preparing and mailing materials to the teachers, correcting assignments, recording assignments which met criteria and collecting posttest data. Principals were responsible for direct monitoring of the progress of the teachers through the courses. Inadequacies in the management of the functions of these two groups of people may have limited the application of the skills and procedures by the teachers in the classroom.

As indicated above, project staff had several responsibilities in the management of the courses. The first was the preparation and mailing of materials. In some cases, materials did not reach the teachers until the recommended submission date of the first assignment. The mail service was sometimes unreliable. It often took a week or more for mail to travel to or from project staff, and assignments were lost in the mail on occasion. Errors were also made in the record keeping procedures, causing teachers to resubmit assignments which had previously been submitted and met criteria. Feedback was given in the form of "OK" for correctly completed assignments, and written comments were made on many of the assignments. Incorrect assignments were returned for correction and resubmission. Many teachers felt the feedback was inadequate in describing the quality of the work and its strengths and weaknesses. It was also noted by Gris and Chapman (1971) that the knowledge of results on assignments is not always reinforcing to the learner. Feedback in itself, then, may not have provided the incentive to continue completing the assigned work.

Principals agreed to monitor the progress of teachers in their school who were participating in the study. Principals were given the materials to read as well as a checklist to use when determining the progress of the teachers through the materials. They were then requested to return the checklist to project staff. Only two of the principals returned the checklists. Other principals may have monitored their teachers, but project staff have no record of this.

The apparent lack of effective feedback and monitoring may also have contributed to the attrition rate. The total percent of attrition and the attrition at the conclusion of each course may be found in Table 13. In response to a questionnaire (see Appendix M) sent to teachers who had dropped either course, several other factors were noted by teachers as contributing to the attrition rate. The three most frequently noted reasons for dropping the course were: (1) it took too much time to do the required work, (2) there was a lack of personal contact with project staff, and (3) help was not readily available when problems arose. The first concern is related to the length of time available to the teachers from receipt of the materials until the scheduled posttests. The latter two concerns are related to inadequate feedback and monitoring and the nature of the self-instructional approach. When using a direct instructional approach for inservice training, Thorpe (1972), reported that skills

Table 13

The Percentage of Teacher Attrition

Throughout the Course of the Reseach

	N	Percentage of Attrition from Total	Percentage of Attrition from Posttest
Teachers initially sent materials	168		
Teachers Posttested on "Teaching Exceptional Children in the Regular Classroom"	96	43	
Teachers Posttested on "Instructional Materials: How Analyze, Adapt, Select, and Develop"	69	59	28

which were stressed during instruction were more evident in the classroom than those which were not. Tegtmeyer et al (1974) and Acacio et al (1972) also found the absence of an instructor to be a critical problem in the use of self-instructional materials.

In summary, the results indicated that the teachers who read the materials did gain knowledge about the information presented in the text. On 47 variables measures, experimental teachers used 19 of the recommended materials and techniques in their classroom more frequently than control teachers. Inadequate feedback, the lack of effective monitoring, and the self-instructional nature of the materials are possible explanations for the lack of application of more of the techniques in the classroom.

Generalizability. The generalizations made from the results of this study are limited by several factors. Some of these factors are directly related to the sample. All of the subjects were elementary classroom teachers in schools in rural areas. The geographic area was limited to northeastern Nevada, southeastern Utah, and southwestern Wyoming. The teachers who participated in the study were volunteers. They were requested to refrain from participating in other inservice training, but it was not possible to control this variable.

In addition, generalization to other groups is limited by procedures used in the study. The procedures included initial consent of school principals to participate and directions for use of the materials. Teachers were to use the materials on a self-instructional basis with the following exceptions: (1) teachers could call project staff collect for assistance, (2) assignments were corrected by project staff, and (3) teachers were posttested in the field by project staff.

Generalizations also may be limited to teacher behavior. Although pupil behavior was measured on the Classroom Observation and Recording Form, no data were collected on the achievement of students whose teachers had used the materials as compared to those who did not. The results are limited only to changes in teachers behaviors.

In summary, generalizations made from this study are limited to geographic area, grade level of the teacher, volunteers, principal involvement, and project staff contact with participants.

Summary of the Discussion

The results of this study indicate that teachers who used the self-instructional materials learned the content of the courses, but applied about 19 out of 47 of the recommended techniques in the classroom. Several factors may have accounted for some of the obtained differences. These include: (1) the reliability and validity of the instruments, (2) the effect of the first course on the posttest of the control group on the second course, (3) record keeping and feedback given the teachers by instructional use of the materials. In addition, generalizations must be limited by the characteristics of the sample and the procedures used during the study.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the effectiveness of two courses designed for the training of regular classroom teachers in rural areas to teach mildly handicapped children in their classrooms. The materials were self-instructional and presented information on specific teaching techniques and on the evaluation and use of instructional materials.

Subjects for the study were elementary classroom teachers who worked in rural school areas, had mildly handicapped children in their classrooms from time to time, and volunteered to take the courses. To determine the effectiveness of the materials, a posttest only control group design was employed. Data were collected on four measures: (1) a criterion referenced test over "Teaching Exceptional Children in the Regular Classroom," (2) a criterion referenced test over "Instructional Materials: How to Analyze, Adapt, Select, and Develop," (3) the Classroom Observation and Recording Form, and (4) the Teacher Inventory. The statistical test used to analyze the collected data was analysis of variance.

The results of this study indicated that (1) teachers in the experimental group made significantly fewer errors than teachers in the control group, (2) teachers in the experimental group used more of the recommended techniques than teachers in the control group, and (3) teachers in the experimental group did not perceive their satisfaction with their job and teaching effectiveness differently from teachers in the control group.

Conclusions

The conclusions drawn from this study are as follows:

1. Teachers in the experimental group made significantly fewer errors on the two criterion referenced tests than teachers is the control group. It may be concluded, then, that the self-instructional materials for "Teaching Exceptional Children in the Regular Classroom" and "Instructional Materials: How to Analyze, Adapt, Select, and Develop" enabled teachers to perform better in the courses as measured by the criterion referenced tests.

2. There was a significant difference in the use of 19 of the 47 recommended materials and techniques in "Teaching Exceptional Children in the Regular Classroom" by experimental teachers. This indicates that some of the techniques presented in the instructional materials were applied in the classroom setting.

3. Teachers in the study indicated that they felt the feedback given was inadequate and the lack of personal contact with project staff was frustrating. This was also supported by Tegtmeyer et al (1974) and Acacio et al (1972). Teachers appear to need consistent, supportive feedback and contact to implement changes and to continue working through the self-instructional materials.

4. Few differences were noted between experimental and control teachers when rating job satisfaction and teaching effectiveness on the Teacher Inventory. The self-instructional materials, then, did little to change teacher perceptions of job satisfaction and teaching effectiveness.

Recommendations

The results of this study lead to the following recommendations for further research:

1. Participants were given ten weeks to complete each course. Many participants, both who did and did not complete the courses, felt this was unrealistic. It is recommended that the time allowed be extended to a minimum of one semester for each course. It may be necessary to increase this to one school year for "Teaching Exceptional Children in the Regular Classroom."

2. The feedback given participants on written assignments should speak more specifically to criteria used in evaluating the assignments. An alternative grading system, such as the use of traditional grades or a check system should be used to notify teachers of the quality of their work.

3. To facilitate generalization of the skills to the classroom, principals or other supervisors should be trained to encourage and reinforce teachers who try to implement changes in their classrooms.

4. Alternative structures for use of the materials should be researched. Two such alternatives are: (1) workshops and (2) a combination of extension courses and practicum. These and similar structures require college or university personnel to travel to rural areas, but may decrease the number of trips necessary as compared to the more traditional inservice approaches. It may also provide more feedback to the teachers.

5. The self-instructional materials should be compared to more traditional approaches to determine the amount of content and application that occurs despite the particular approach utilized.

BIBLIOGRAPHY

Abeson, A. Movement and momentum: government and the education of handicapped children. Exceptional Children. 1972, 39(1), 63-66.

Abeson, A. Movement and momentum: government and the education of handicapped children --II. Exceptional Children, 41(2), 109-115.

Abeson, A. & Bolick, N. A continuing summary of pending and completed litigation regarding the education of handicapped children. Reston, Virginia: Council for Exceptional Children, 1974.

Abeson, A., Bolick, N., & Hass, J. A primer on due process: education decisions for handicapped children. Reston, Virginia: Council for Exceptional Children, 1975.

Acacio. F., McKinley, M., & Scruggs, M. Self-instructional program of training for food service personnel. Journal of Home Economics, 1972, 64(2), 39-45.

Adams, A. Structure and content of inservice education programs. Education, 1971, 92(2), 13-16.

Alexander, D. Development of a self-instructional course in engineering statics. Final report. Seattle, Washington: 1972. (ERIC Document Reproduction Service No. ED 072 971)

The AMIDS in-service teacher training workshop for vocational educators of disadvantaged and handicapped students: supplementary materials -- part A. Montgomery, Alabama: Link Enterprises, Inc., 1973. (ERIC Document Reproduction Service No. ED 086 817)

The AMIDS in-service teacher training workshop for vocational educators of disadvantaged and handicapped students: supplementary materials -- part A. Montgomery, Alabama: Link Enterprises, Inc., 1973. (ERIC Document Reproduction Service No. ED 086 818)

Anastasi, A. Psychological testing. New York, N.Y.: MacMillan Company, 1961.

Baker, R. & Schutz, R. Instructional product development. New York: Van Nostrand Reinhold Co., 1971.

Bohrson, R. & Gann, E. Programs for those rural schools which are necessarily existent. Denver Colorado: National Committee for Children and Youth, 1963. (ERIC Document Reproduction Service No. ED 012 644)

Borg, W. The minicourse -- a milestone on the road to better teaching. British Journal of Educational Technology, 1971, 2(1), 14-23.

Borg, W. Field testing and evaluation in the Utah State University protocol project. New Orleans, Louisiana: paper presented at American Education Research Association, 1973. (ERIC Document Reproduction Service No. ED 076 577)

Borg, W. & Gall, M. Educational research: an introduction. New York, N.Y.: David McKay, 1971.

Bosco, J. and others. The development and evaluation of an inservice education model to develop informal individualized learning and teaching practices. Kalamazoo, Michigan: Western Michigan University 1975. (ERIC Document Reproduction Service No. ED 110 411)

Boyce, E. An exploratory study of two in-service training programs for twenty teachers on race and poverty in the inner city. Boston, Massachusetts: School of Education (dissertation), 1972. (ERIC Document Reproduction Service No. ED 084 332)

Bradfield, R., Brown, J., Kaplan, P., Rickert, E., & Stannard, R. The special child in the regular classroom. Exceptional Children, 1973, 39(5), 384-390.

Budoff, M. Comments on providing special education without special classes. Studies in learning potential, volume 2, number 25. Cambridge, Massachusetts: Research Institute for Educational Problems, 1971. (ERIC Document Reproduction Service No. ED 058 707)

Campbell, D. & Stanley, J. Experimental and quasi-experimental designs for research. Chicago, Illinois: Rand McNally, 1963.

Carlson, L. & Potter, R. Training classroom teachers to provide in-class educational services for exceptional children in rural areas. Journal of School Psychology, 1972, 10(2), 147-151

Charles, E. The preparation of teachers for rural schools. Tucson, Arizona: University of Arizona (dissertation), 1969. (ERIC Document Reproduction Service No. ED 027 999)

Christoplos, F. Keeping exceptional children in regular classes. Exceptional Children, 1973, 39(7), 569-572.

Dagne, F. In-service education for teachers. Niles, Illinois: East Maine School District Number 63, 1968. (ERIC Document Reproduction Service No. ED 031 456)

Descriptions of innovative teaching programs directed toward: 1. integration of children with special needs in regular classrooms. 2. Serving severely handicapped children. Boston University, Massachusetts: New England Special Education Instructional Materials Center, 1973. (ERIC Document Reproduction Service No. ED 081 146)

Directory of CITH training materials. Bloomington, Indiana: Center for Innovation in Teaching the Handicapped, 1974. (ERIC Document Reproduction Service No. ED 094 522)

Eachur, H. Inservice training of teachers as behavior modifiers: review and analysis. Washington, D.C.: Bureau of Educational Personnel Development, 1971. (ERIC Document Reproduction Service No. ED 083 145)

Edelfelt, R. Inservice education of teachers: priority for the next decade. Journal of Teacher Education, 1974, 25(3), 250-252.

Educational Facilities Laboratories. One out of ten: school planning for the handicapped. New York: Educational Facilities Laboratories, 1974.

Farrer, K. & Guest, E. A cooperative instructional services program for improving educational services personnel to teach special education students in the regular classroom. Director's final report. Logan, Utah: Utah State University, 1970. (ERIC Document Reproduction Service No. ED 043 598)

Fiel, N. & Ways, P. Development and evaluation of self-instructional materials. Journal of Medical Education, 1972, 47(10), 822-824.

Finch, C. The effectiveness of selected self-instructional approaches in teaching diagnostic problem solving. Journal of Educational Research, 1972, 65(5), 219-223.

Gampel, D., Gottlieb, J., & Harrison, R. A comparison of the classroom behaviors of special class EMR, integrated EMR, low IQ, and nonretarded children. Studies in learning potential. Volume 3, number 41. Cambridge, Massachusetts: Research Institute for Educational Problems, 1973. (ERIC Document Reproduction Service No. ED 085 964)

Glenn, G. & Summers, W. Problems of rural special education -- unique or induced? Breakthrough, 1973, 3(1), 9-11.

Gottlieb, J. and others. Classroom behavior of retarded children before and after reintegration into regular classes. Studies in learning potential. Volume 3, number 49. Cambridge, Massachusetts: Research Institute for Educational Problems, 1973. (ERIC Document Reproduction Service No. ED 085 967)

Green, M. and others. A self-instructional system in electricity. Portland, Oregon: Northwest Regional Educational Laboratory, 1970a. (ERIC Document Reproduction Service No. ED 059 600)

Green, M. and others. A self-instructional system in welding. Portand, Oregon: Northwest Regional Educational Laboratory, 1970b. (Eric Document Reproduction Service No. ED 059 602)

Green, M. and others. A self-instructional system in plastics. Portland, Oregon: Northwest Regional Educational Laboratory, 1970c. (ERIC Document Reproduction Service No. ED 059 603)

Gris, G. L. & Chapman, K. Knowledge of results and other prossible reinforcers in self-instructional systems. Final report. Ann Arbor, Michigan: Center for Research on Language and Language Behavior, 1971. (ERIC Document Reproduction Service No. ED 049 464)

Haan, A. Inservice design for a small school district. San Francisco, California: Frederic Burk Foundation for Education, 1966. (ERIC Document Reproduction Service No. ED 010 082)

Hammons, G. Educating the mildly retarded: a review. Exceptional Children, 1972, 38(7), 565-570.

Handicapped children in the regular classroom. Fountain Valley School District, California: Fountain Valley School District, 1972. (ERIC Document Reproduction Service No. ED 075 592)

Hargiss, G. Self-instructional material in basic music therapy for elementary teachers. Lawrence, Kansas: Kansas University, 1967. (ERIC Document Reproduction Service No, ED 010 504)

Heath, E. In-service trianing: preparing to meet today's needs. Academic Therapy, 1974, 9(5), 267-280.

Heimler, C. & Cunningham, J. Autoinstructional materials in science methods classes. American Biology Teacher, 1972, 34(1), 25-27.

Hofmeister, A. Models for "educational research and development." Logan, Utah: Special Education Instructional Technology Project, Utah State University, no date.

Iano, R. Shall we disband special classes? Journal of Special Education, 1972, 6(2), 167-177.

The incinerator: section one, basic parts and fundamentals. Part 5, air pollution training institute self-instructional course SI-466. New York, New York: Enviromental Protection Agency, 1973. (ERIC Document Reproduction Service No. ED 103 262)

The incinerator: section two, maintenance and troubleshooting. Part 6, air pollution training institute self-instructional course SI-466. New York, New York: Environmental Protection Agency, 1973. (ERIC Document Reproduction Service No. ED 103 263)

Inservice education of teachers: research summary 1966-S1. Washington, D.C.: National Education Association, 1966. (ERIC Document Reproduction Service No. ED 022 728)

Johnson, R. Self-instructional packages: good or bad? Junior College Journal, 1971, 42(1), 18-20.

Johnson, S. & Radius, M. Teacher in-service. Castro Valley , California: Castro Valley Unified School District, 1974. (ERIC Document Reproduction Service No. ED 109 856)

Johnson, S. & Johnson, R. The self-instructional materials project: progress and prospects. Chapel Hill, North Carolina: North Carolina University School of Medicine, 1973. (Eric Document Reproduction Service No. ED 086 252)

Kahn, R., Conklin, J., & Glover, R. A self-instructional program in microscopic anatomy. Journal of Medical Education, 1973, 48(9), 859-863.

Kassay, J. Self-instructional systems. Journal of Industrial Arts Education, 1969, 29(1), 35-40.

Kreinberg, N. & Chow, S. Configurations of change: the integration of mildly handicapped children into the regular classroom. San Francisco, California: Far West Laboratory for Educational Research and Development, 1973. (ERIC Document Reproduction Service No. ED 089 513)

Lombardi, T. Changing institutional structures for effective special education programs. Education and Training of the Mentally Retarded, 1972, 7(2), 99-103.

Lysaught, J. Self-instruction in nursing education: the impact of technology on professional curricula. Educational Technology, 1969, 9(7), 19-24.

McEhlattan, G. & Klopfer, L. An autoinstructional chemistry course for elementary school teachers. Science Education, 1974, 58(3), 303-311.

Maddox, K. and others. New dimensions in teacher education inservice. Charleston, West Virginia: Kanawha County Teacher Education Center, 1970. (ERIC Document Reproduction Service No. ED 053 094)

Merwin, W. The use of competency based modules in training social studies teachers. New Orleans, Louisiana: American Educational Research Association, 1973. (ERIC Document Reproduction Service No. ED 079 174)

Morrey, J. Dissemination of mental retardation services and treatment through recruitment and training of rural area teachers, 1972-1973. Director's report. Pocatello, Idaho: Southeast Idaho Child Development Center, 1973. (ERIC Document Reproduction Service No. ED 100 095)

Novotny, P. Mainstreaming the EMR is neither a panacea nor a simple solution: a research study. 1974. (ERIC Document Reproduction Service No. ED 101 522)

Ogg, E. Securing the legal rights of retarded persons. New York, New York: Public Affairs Pamphlet #492, 1973.

President's Committee on Mental Retardation. Compendium of law suits establishing the legal rights of mentally retarded citizens. Contract HEW-OS-SA-10697-74.

Rich, B. & Loew, A. Packaged self-instructional program number 12-1024-1272-1. Eureka, California: Humboldt County Schools, 1973. (ERIC Document Reproduction Service No. ED 094 711)

Ryor, J. Mainstreaming. Today's Education, 1976, 65(2), 5.

Scanlon, R. & Brown, M. Inservice education for individualized instruction. Educational Technology, 1970, 10(2), 62-64.

Schreiber, R. & Markel, G. Assessment of a self-instructional conversion model for elementary schools. A final report. Ann Arbor, Michigan: Ann Arbor Public Schools, 1973. (ERIC Document Reproduction Service No. ED 107 245)

Shaw, S. & Shaw, W. The in-service experience plan, or changing the bath without losing the baby. *Journal of Special Education*, 1972, *6*(2), 121-126.

Sidnell, R. *The development of self-instructional drill materials to facilitate the growth of score reading student conductors. Final report*. East Lansing, Michigan: Michigan State University, 1968. (ERIC Document Reproduction Service No. ED 023 344)

Smith, J. Why not practice what you preach? *Man/Society/Technology*, 1974, *33*(4), 101-103.

Stowitschek, J. & Hofmeister, A. Effects of minicourse instruction on teacher performance and pupil achievement. *Exceptional Children*, 1974, *40*(7), 490-495.

Stritter, F., Burford, H., Johnson, S., & Talbert, L. Documentation of the effectiveness of self-instructional materials. *Journal of Medical Education*, 1973, *48*(12), 1129-1132.

Suess, J. Teaching psychodiagnosis and observation by self-instructional programmed videotapes. *Journal of Medical Education*, 1973, *48*(7), 676-683.

Swichk, K. & Henley L. *The rural and small schools: a comprehensive information booklet*. Springfield, Illinois: Illinois Local Control of Schools Assocation, 1975. (ERIC Document Reproduction Service No. ED 110 265)

Teachers for the rural world. Pocatello, Idaho: Idaho State University, 1970. (ERIC Document Reproduction Service No. ED 051 101)

Tegtmeyer, C., Keats, T., Pullen, E., & Langman, J. The teaching of roentgen anatomy to medical students: a self-instructional approach. *Journal of Medical Education*, 1974, *49*(5), 455-456.

Thiagarajan, S., Semmel, D., & Semmel, M. *Instructional development for training teachers of exceptional children. A sourcebook*. Bloomington, Indiana: Center for Innovation in Teaching the Handicapped, 1974.

Thorpe, H. *Validation of a teacher self-accountability program*. Unpublished doctoral dissertation, Utah State University, 1972.

Tyler, J. Developing training packages. *Exceptional Children*, 1973, *39*(5), 405-406.

Yates, J. Model for preparing regular classroom teachers for "mainstreaming." *Exceptional Children*, 1973, *39*(6), 471-472.

APPENDICES

Appendix A

Demographic Data

INFORMATION QUESTIONNAIRE

Date ____________________

Full Name (please print) ____

Sex: ________ Male ________ Female Age: __________

Education Background

Number of years of college ________

Highest degree received: ______ Bachelor's ______ Master's ______ Doctorate

______ Other (specify) ____________________________

Major(s) ____

Minor(s) ____

Additional hours earned following most advanced degree: ______ Quarter hours

______ Semester hours

Teaching Experience

Grade presently teaching: K 1 2 3 4 5 6 7 8 9 10 11 12 (circle one)

Other (specify) ____________________________

How many years have you taught this grade? ________
How many years have you taught? ________

Related Information

Have you had any courses covering the following topics?

Yes	No	
☐	☐	Behavior Measurement and Change: This includes such topics as reinforcement contingency contracting, and behavior modification.
☐	☐	Instructional Planning: This includes such topics as task analysis, skill hierarchies, and performance criteria.
☐	☐	Criterion Referenced Testing: This includes such topics as test evaluation, skill assessment, and instructional use of matrices.
☐	☐	Classroom Management: This includes such topics as daily routine, record keeping, classroom arrangement, and use of tutors.
☐	☐	Instructional Materials: This includes such topics as analysis, selection, adaptation, and development of materials.

Demographic Data Code

Sex:	1 = male, 2 = female	
Age:		
College:	Years of college training	
Degrees:	Most recent degree received	
Grade:	T = currently teaching multiple grades 0 = grade being taught	
Years in grade:		
Years teaching:	Previous experience	
BM&C:	Behavior modification and change	1 = yes, 2 = no
IP:	Instructional planning	1 = yes, 2 = no
CRT:	Criterion referenced testing	1 = yes, 2 = no
CM:	Classroom management	1 = yes, 2 = no
IM:	Instructional planning	1 = yes, 2 = no

Demographic Data: Experimental Group

	School	School	Group E=1 C=2	Sex M=1 F=2	Age	Age	College	College	Degrees	Grade T	Grade 0	Years in Grade	Years in Grade	Years Teaching	Years Teaching	BM&C Y=1 N=2	IP	CRT	CM	IM
2E1		1	1	2	6	2		4	1	2			7		9	1	2	2	2	2
2E2		1	1	2	2	5		5	1	2			2		2	2	1	2	1	1
2E3		1	1	1	2	5		4	1	2			4		4	1	1	1	1	1
3E1		2	1	2	2	4		4	1	3			2		2	2	2	1	2	1
5E1		3	1	2	6	0		4	1	2			6		7	2	2	2	2	2
6E1		4	1	2	2	4		4	1	5			2		2	1	2	2	1	2
11E1		5	1	2	4	4		4	1		2		4	1	3	2	1	2	1	2
11E2		5	1	2	5	0		4	1	2		1	1	1	4	1	2	1	2	2
12E5		6	1	1	2	7		4	1		4		5		5	1	1	1	1	1
11E4		5	1	2	2	5		4	1		2		3		4	1			1	
12E2		6	1	1	3	5		4	1		6		6		8	1	2	1	2	2
13E1		7	1	2	5	2		4	1		3		1		2	1		1	1	1
13E2		7	1	2	2	7		4	1		1		1		1	2	2	2	2	2
15E1		8	1	2	4	8		4	1		3		4	1	3	1				
15E2		8	1	2	4	2		4	1		-1		7		7	1	1	1	1	1
15E3		8	1	2	3	7		4	1		1		9	1	6	1	1		1	1
15E4		8	1	2	2	5		4	1		5		3		3	1	1	1	1	1
15E5		8	1	2	3	7		4	1		4		5		7	1	1	1	1	1
16E1		9	1	2	3	6		4	1	2			6		6	1	1		1	
16E2		9	1	2	3	0		4	1	2			5		6	1	1	2	1	2
16E5		9	1	2	3	9		4	1		4		9	1	3	2	2	2	2	2
16E6		9	1	2	5	9			2		-1	1	6	1	9	1	1	2	1	1
17E1	1	0	1																	
17E2	1	0	1	2	2	8		4	2		-1		1		4	1	2	1	1	2
23E1	1	1	1	2	4	1		4	1		6		7		7	2	2	2	2	2
23E2	1	1	1	1	3	6		6	2		9		8	1	4	2	1	2	1	1
24E2	1	2	1	2	2	2		4	1		1		1		1	2	2	2	2	2
24E3	1	2	1	2	2	2		4	1	7			1		1	1	1	1	1	1
25E2	1	3	1	2	4	1		4	1		1		7	1	4	1	2	2	1	2
26E1	1	4	1	2	4	5		5	2		2	1	5	1	9	1	2	1	1	1
26E2	1	4	1	1	2	6		4	1		5		3		3	1	1	1	1	1
26E3	1	4	1	2	6	1		5	1		1			3	9	1		1	1	
26E4	1	4	1	2	2	3		4	1		3		2		2	1			1	
26E5	1	4	1	1	2	7		5	1		6		2		2	2	2	2	1	2
26E6	1	4	1	1	2	7			1		6		2		2	2	2	2	1	2

Demographic Data:

Control Group

	School	School	Group E=1 C=2	Sex M=1 F=2	Age	Age	College	College	Degrees	Grade T	Grade 0	Years in Grade	Years in Grade	Years Teaching	Years Teaching	BM&C Y=1 N-2	IP	CRT	CM	IM
1C1	1	5	2	2	5	2		4	2	8			3	1	0	2	1	1	1	1
1C2	1	5	2	2	6	5		4	1		3		1	1	4	2	2	2	2	2
2C1	1	6	2	2	5	4		5	1		-1		7	1	4	2	2	2	1	2
2C2	1	6	2	2	3	1		4	1		5		4		6	2	2	2	2	1
2C3	1	6	2	2	2	5		4	1		3		2		3	1	2	1	2	1
2C4	1	6	2	1	3	6		6	1		6		5		6	2	2	2	1	2
2C5	1	6	2	2	2	5		4	1		4		1		3	2	2	2	2	
3C1	1	7	2																	
3C2	1	7	2	2	3	4		4	1	3			6		6					
4C1	1	8	2	2	2	1		3	1	6			1		1	1	2	2	2	1
5C1	1	9	2	1	2	4		5	1		6		2		2	1	2	2	2	2
5C2	1	9	2	2	3	2		4	1	2			5		6	2	2	2	2	2
5C3	1	9	2	2	4	4		4	1		1	1	0	2	2	1	2	1	1	2
5C4	1	9	2	2	3	2		5	1		2		4		9	1	1	1	1	1
5C5	1	9	2	2	4	8		4	1		-1		3		3	1			1	
5C6	1	9	2	2	3	4		4	1		1		8	1	1	1	2	1	1	2
5C7	1	9	2	2	3	9		4	1		2		4	1	0	2	1	2	2	2
5C8	1	9	2	1	3	4		5	2		9		6	1	0				1	1
5C9	1	9	2	2	4	7		4	1		4		6	2	4	2	2	1	2	1
6C1	2	0	2	2	3	3		4	1		1		1	1	3	2	2	2	2	2
6C2	2	0	2	2	3	6		4	1		3		6		9	2	2	2	2	2
6C3	2	0	2	2	4	3		5	2		4		6	1	4					
6C4	2	0	2	2	2	4		4	1		2		3		3	1	2	2	1	1
6C5	2	0	2	2	3	4		5	1		6	1	0	1	5	1	2	1	1	2
12C1	2	1	2	2	3	9		4	1		3		2		5	2	2	1	2	2
12C2	2	1	2	1	4	5			3		9		8	2	0	2	2	1	1	2
12C3	2	1	2	2					2		5	1	5	2	3	2	2	2	2	2
12C4	2	1	2	2	5	9		4	2		1		5	2	6	1	1	1	1	1
12C5	2	1	2	1	2	3		4	1		6		1		1	2	2	2	2	1
14C1	2	2	2	1	2	2		2	4							2	2	2	2	2
14C2	2	2	2	1	2	7		4	1		6		2		2	2	2	2	2	2
14C3	2	2	2	1	2	7		4	1		-2		1			1	2	2	2	2
14C4	2	2	2	2	3	5		6	2		1		4		4	2	2	2	2	2
14C5	2	2	2	2	2	2		3	1		3		1		1					
14C6	2	2	2	2	2	4		4	1		5		1		1	2	2	1	2	1
14C7	2	2	2	1	3	0		5	2		4		4		9	1	1	1	1	1
14C8	2	2	2	2	3	0		5	1		2		1		1	2	1	2	1	2
14C9	2	2	2	2	3	4		4	1		2		1		1	1	1	1	2	1
14C10	2	2	2	2	2	4		4	1		1		3		3	2	2	2	2	2
14C11	2	2	2	1	[illegible]	7		5	1		4		2		2	1	1	2	2	1
14C12	2	2	2	2	5	4		4	1		3		2	2	3	2	2	2	2	2
15C1	2	3	2	1	2	6		4	1		7		7		7	1	1	1	1	1
15C2	2	3	2	1	3	7		7	2		4		3		7	2	2	1	1	1
15C3	2	3	2	2	4	7		4	1		3		3	1	0				1	
17C1	2	4	2	2	2	6		4	1	2			1		5	1	1	1	1	1
17C2	2	4	2	2	4	3		4	1		3		2		4	2	2	2	2	2
17C3	2	4	2	2	4	1		4	1		2		7	1	8	2	2	2	2	1
17C4	2	4	2	2	4	8		4	1		1		4		5	1	2	2	1	2
18C1	2	5	2	2	3	7		5	1		6		4		6	1	2	1	2	2
21C1	2	6	2																	
22C1	2	7	2	2	4	2			2		4		8		9	1	2	2	1	2
23C1	2	8	2	2	3	1		4	1		4		1		4	1	2	1	1	1
24C1	2	9	2	1	3	0		4	1		6		9		9	1	2	2	2	2
25C1	3	0	2	2	2	3		4	1		-1		2		2				1	1
25C2	3	0	2	1	2	5		5	1		5		2		3	1	2	2	2	2
25C3	3	0	2	1	2	2		3	1		6		2		2	1	2	2	2	2
25C4	3	0	2	2	2	4		4	1		2		2		3	2	2	2	1	2
25C5	3	0	2	2	2	3		4	1		2		1		1	2	2	2	2	2
26C1	3	1	2	2	3	0		4	1		5		1		2	1	1	2	2	1
26C2	3	1	2	2	3	4		4	1		4		1		2	1	1	1	1	1
26C3	3	1	2	1	2	2		4	1		6		1		1	1	1	1	1	1

Appendix B

Table 14

Table 14

Differences in Demographic Data on Subjects Participating in "Teaching Exceptional Children in the Regular Classroom" and "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

	Course A[1]	Course B[2]
Total participants	96	69
Average age	35	35
Sex (% female)	75	79
Years in college	4	4
B.S. or B.A. degree	84%	88%
M.S. or M.A. degree	14%	10%
Years teaching	8	7
Years in present grade	4	4
Previous training in specified subject areas:		
Behavior Measurement and Change	56%	56%
Instructional Planning	33%	32%
Criterion Referenced Testing	41%	41%
Classroom Management	55%	48%
Instructional Materials	54%	42%

1 -- Course A: "Teaching Exceptional Children in the Regular Classroom"

2 -- Course B: "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

Appendix C

Materials for the Courses

The materials used for the two courses are bound in two single volumes. Each course is one volume.

For copies of the materials, write:

Dr. Hyrum S. Henderson
Department of Special Education
UMC 65
Utah State University
Logan, Utah 84322

Specify which material(s) you wish to get by course title: "Teaching Exceptional Children in the Regular Classroom" and/or "Instructional Materials: How to Analyze, Adapt, Select, and Develop".

Appendix D

Criterion Referenced Test and Answer Sheet for

"Teaching Exceptional Children in the Regular Classroom"

FINAL EXAM SP. ED. 656

Teaching Exceptional Children in the Regular Classroom

On this multiple choice exam each question may have any number of correct answers. There may be only one correct answer, more than one correct answer or even all correct answers among the choices given. On the answer sheet circle all numbers that correspond to correct choices. Singular nouns, verbs and adjectives do not necessarily indicate a single correct answer, nor do plural nouns, verbs and adjectives necessarily indicate more than one correct answer. Try to determine whether each choice is correct independent of the other choices given. Because you have picked a correct answer already does not mean that the others can be eliminated as in the usual multiple choice test.

Please keep in mind that the answers should be made according to the instructional material you used in the course, whether or not you agree with all of it.

Please do not mark on the test. Record answers on the answer sheet provided.

If you have any questions, please ask them now. You may begin when you are ready. You may have up to an hour and a half should you need it.

TEST

Course: Sp. Ed. 656
Teaching Exceptional Children in the Regular Classroom

A. What is the major objective of education? (only one correct answer)

1. effective teaching
2. student socialization
3. to make educational information available to all
4. student learning
5. student maturation

B. What the learner does is:

6. his behavior
7. his responses
10. his practice
11. none of the above

C. Anything that is experienced or witnessed through the senses is said to be:

12. behavior
13. measurable
14. responses
15. verifiable
16. visible
17. observable
20. learned

D. Anything that can be objectively quantified (counted) is:

21. measurable
22. responses
23. visible
24. feedback

E. What is the source of feedback to the teacher regarding student learning?

25. student behavior
26. student responses
27. student feelings
30. student practice
31. student reinforcement
32. a contingency table
33. a token system

F. If something is perceived through the physical senses by yourself and by others, it is:

34. behavior
35. measurable
36. responses
37. verifiable
40. visible
41. observable
42. learned
43. feedback

G. The number of correct responses divided by the total number of responses is:

44. accuracy
45. elapsed time
46. rate of response
47. latency
50. none of the above

H. The number of correct responses divided by the elapsed time is:

51. accuracy
52. rate of response
53. latency
54. reaction time

I. If a student was able to say 12 sounds in 10 seconds but got 3 sounds wrong, what was his/her rate of correct responding ?

55. .30 sounds per second
56. .75 sounds per second
57. .90 sounds per second
60. 1.20 sounds per second
61. none of the above

J. If a student was able to say 12 sounds in 10 seconds but got 3 sounds wrong, what was his/her accuracy?

62. (0.25 = 25%)
63. (0.75 = 75%)
64. (0.90 = 90%)
65. none of the above

K. Behavior is anything that a living thing does which is:

66. measurable
67. verifiable
70. visible
71. observable
72. learned

L. The total number of correct plus incorrect responses divided by the elapsed time is called?

73. accuracy
74. relative frequency
75. rate of correct responding
76. reaction time
77. none of the above

M. The most important word in a statement of behavior is:

100. noun
101. subject
102. verb
103. adjective

N. If the student is learning, what must be changing?

104. behavior
105. responses
106. attitudes
107. feelings
110. attention
111. interest

O. What is a necessary measure of any behavior we want a student to learn?

112. accuracy
113. elapsed time
114. rate of response
115. none of the above

P. What type(s) of measurement is/are necessary when the behavior to be performed is a specific task which is the same each time?

116. accuracy
117. elapsed time
120. trials to criterion
121. magnitude of response
122. reaction time
123. none of the above

Q. Behavior whose rate or frequency is limited only by the student himself is called:

124. free floating
125. respondent
126. free operant
127. unrestricted

R. Under what conditions is accuracy alone an appropriate measure?

130. when the criteria for competency demonstration are quite stringent
131. when the criteria for competency demonstration are quite lenient
132. when the student is to acquire a new behavior
133. when you desire the most reliable measure
134. when you desire the most valid measure
135. when you desire the simplest measure possible
136. none of the above

S. What requirement(s) is/are there for the appropriate use of rate as a measure of learning?

137. the student's rate of response should be limited only by his ability
140. the responses must all be the same or of approximately equal difficulty
141. a fixed length of time should be specified
142. a fixed size task should be specified
143. feedback should follow each response
144. none of the above

T. According to the text, which of the following is/are commonly used way(s) of observing responses and time?

145. give a sample of the task to the student and stop him after a fixed length of time
146. time the student on a task and stop him after a fixed number of responses
147. time the student on a task and stop him after a randomly selected number of responses
150. give the student a fixed size task and stop him after a fixed length of time
151. give the student a randomly selected number of responses to perform and stop him after a randomly selected length of time
152. none of the above

U. Indicate what type(s) of measurement could have been used to make the statement that the student had twenty percent correct.

153. accuracy
154. elapsed time
155. rate of response
156. magnitude of response

V. Indicate what type(s) of measurement could have been used to arrive at the statement that the student required five seconds.

157. elapsed time
160. rate of response
161. trials to criterion
162. latency
163. reaction time

W. Indicate what type(s) of measurement could have been used to arrive at the statement that the student moved sixty pounds.

164. accuracy
165. trials to criterion
166. magnitude of response
167. none of the above

AA. Operant behavior is controlled by?

170. its baseline
171. its consequences
172. eliciting stimuli
173. authorities
174. none of the above

AB. What always produces an increase in behavior?

175. reinforcement
176. punishment
177. operant conditioning
200. behavior modification
201. praise
202. candy
203. tokens
204. free time
205. early recess
206. negative stimuli
207. none of the above

AC. What is the purpose of collecting data before a treatment is implemented?

210. to determine the treatment
211. to satisfy the administrator
212. to determine the effect of the treatment
213. none of the above

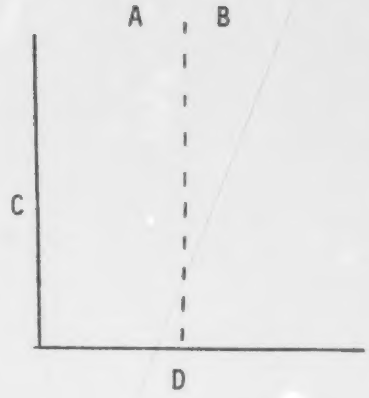
AD. What precaution(s) should be taken each time an academic behavior is measured?

213. conditions should be as similar as possible
214. tasks should be approximately equal in length
215. responses should be approximately equal in difficulty
216. program changes should be made daily based on the previous day's data
217. control data should be obtained prior to the measurement of behavior
220. behavioral measurement should be utilized only when students are falling behind in school

AE. If the data from continued measured performance show an increase in performance, then we can say that the event or item made available contingent on the performance of the student is a(n)________ for that behavior, and for that particular student.

221. an elicitor
222. a reinforcer
223. a punisher
224. a discriminative stimulus
225. an unconditioned stimulus
226. a contingency
227. a token
230. an operant
231. a respondent
232. a criterion
233. none of the above

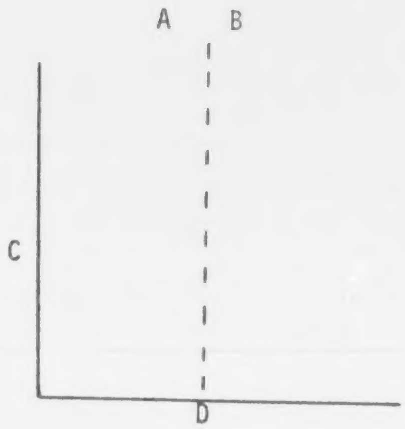
AF. A teacher has been measuring the number of correct sounds a student can say per minute each day. After five days she/he starts saying "good saying sounds" each time the student improves. On his/her performance graph indicate what label should be written in each position (A, B, C, & D).



What should be written in position "A"

234. performance
235. rate (sounds/minute)
236. verbal praise
237. baseline
240. correct sounds
241. responses
242. none of the above

What should be written in position "B"



243. minutes
244. performance
245. rate (sounds/minute)
246. verbal praise

What should be written in position "C"

247. sounds
250. days
251 rate (correct sounds/minute)
252. accuracy (percent correct)

What should be written in position "D"

254. minutes
255. days
256. baseline
257. none of the above

AG. Which of the following are advantages of the point system when compared with token systems utilizing poker chips, play money, plastic objects, pieces of paper, and so forth?

260. it does not become necessary to change requirements because a different reinforcer is being used
261. points are longer lasting
262. points allow for "free choice"
263. points are less likely to be lost or stolen
264. points do not require storage
265. points are more effective
266. points require no tangible objects
267. points can be accumulated for exchange
270. points give the student immediate feedback as to his progress
271. points are more readily accepted by students
272. points are more readily accepted by administrators

AH. What procedure(s) should be utilized in filling out the contingency table below?

Students	Initial Rate	Number of Points Available								
		1	2	3	4	5	6	7	8	
1. Jim	10									Required Reading Rate (words per minute)
2. Joe	30									
3. Jane	50									
4. Jan	70									
5. Jack	90									

273. use the highest score from the previous week as the lowest requirement
274. use the previous weeks' average as the lowest requirement
275. require smaller amounts of improvement for lower performing students
276. require smaller amounts of improvement for students with lower intelligence quotients
277. as the student attains moderate gains increase the reinforcement frequency
300. when the student reaches the performance standards set for mastery give maximum reinforcement for maintaining that level of performance
301. when the student reaches the performance standards set for mastery, gradually decrease the reinforcement frequency as long as the student maintains that level of performance
302. when the student reaches the performance standards set for mastery, gradually fade out the points substituting verbal praise
303. as mastery is attained on one behavior and the student is moved to a new behavior, anticipate a drop in performance and decrease reinforcement requirements accordingly
304. as mastery is attained on one behavior and the student is moved to a new behavior, increase reinforcement frequency

AI. How could you increase the likelihood that the events you choose for reinforcers will actually function as reinforcers?

305. use praise or positive teacher reaction
306. have a variety of events available and let the student choose from them
307. utilize a competitive system because winning serves as a reinforcing event
310. have the other students reinforce appropriate behavior in their fellow students

AJ. Which of the following are necessary in managing a reinforcement system?

311. be consistent
312. be positive
313. vary your contingencies
314. vary your reinforcers
315. vary your instruction
316. vary your assignments
317. increase student talk

AK. Which of the following are necessary for appropriate teacher verbal behavior?

320. praise the entire class generally (e.g. good class)
321. praise the entire class indicating (the specific appropriate behavior(s)
322. praise specific students generally (e.g. good boy, Jimmy)
323. praise behavior specifically
324. give praise and tokens together
325. give praise and tokens separately
326. give praise and primary reinforcers separately

AL. What types of behavior should a teacher respond to?

327. behavior that disrupts the class
330. desirable behavior
331. out of seat behavior
332. behavior that you do not wish to reinforce
333. behavior that you wish to reinforce
334. behavior that you do wish to punish
335. undesirable behavior
336. behavior that threatens the safety of the class or some individual
337. studying behavior
340. making a correct response in an appropriate situation
341. crying
342. "off task" behavior

AM. What types of behavior should a teacher not respond to?

343. behavior that disrupts the class
344. out of seat behavior
345. "talking out" behavior
346. behavior that you do not wish to reinforce
347. behavior that you wish to punish
350. behavior that you do not wish to punish
351. undesirable behavior
352. studying behavior
353. crying
354. "off task" behavior

AN. What types of behavior should you punish?

355. non-dangerous behavior that disrupts the class
356. behavior that you do not wish to reinforce
357. undesirable behavior
360. behavior that threatens the safety of the class or some individual
361. "off task" behavior
362. none of the above

AO. What types of behavior should you reinforce?

363. desirable behavior
364. behavior that you do not wish to punish
365. improved performance
366. making a correct response in an appropriate situation

AP. What is the most satisfactory way to deal with inappropriate behavior which is maintained by the attention of the other students?

367. ignore the inappropriate hehavior
370. put the misbehaving student in "time-out"
371. ignore the inappropriate behavior and reinforce those other students who do not respond to the inappropriate behavior
372. none of the above

AQ. Which of the following statement(s) are true of "extinction"?

373. one difficulty in using this method is determining what is maintaining the behavior
374. it is important to be consistent when using this method
375. it is not sufficient in many situations to attempt to use extinction as your only method of behavioral control
376. it usually results in an initial increase in behavior, followed by a gradual decrease in behavior
377. it usually results in an initial decrease in behavior, followed by a gradual increase in behavior
400. it should be used in conjunction with reinforcement of incompatable behavior
401. it is defined as the withholding of punishment for a specified behavior

AR. What is the single preferred method of decreasing undesirable student behavior?

402. extinction
403. reinforce appropriate behavior
404. time-out
405. send the student to the principal
406. none of the above

BA. Read each of the skill statements listed below. Circle the number on the answer sheet for those skill statements which meet the three criteria for well-written skill statements.

407. Given a printed list of animal names, the student marks those with "L" that are born live, and with "E" those that are hatched from eggs.

410. Given all of the basic division facts for numbers 0-9 printed in the form $7\overline{)35}$ the student writes the quotient for each.

411. When asked, the student writes all of the components of the circulatory system.

412. Given all the letters of the alphabet printed on cards, the student says the sound of each.

413. Given several daily newspapers, the student indentifies examples of local, state, and national news articles; feature articles, athletic scores, editorials, letters-to-the editors, classified ads, serial comics, and obituaries.

BB. For the following skill statements, select the appropriate minimum performance criterion or criteria.

	CRITERIA
Upon request, the student orally reads known words in connected sentences.	414. 100% correct 415. 90-100% correct 416. x number correct per min.
When the teacher presents pairs of flash cards each containing one number, the student writes >, =, or < between each pair.	417. 100% correct 420. 90-100% correct 421. x number correct per min.
When given a picture of a flower, the student writes the names of the flower parts.	422. 100% correct 423. 90-100% correct 424. x number correct per min.
When given a sheet with 5 words printed on it, the student locates the words in the dictionary and writes the correct definition for each.	426. 100% correct 427. 90-100% correct 430. x number correct per min.
When presented with known letter sounds laid in rows on a table, the student says sounds orally.	431. 100% correct 432. 90-100% correct 433. x number correct per min.
When presented with 10 division problems with 2 digit divisors and dividends, the student writes the quotients.	434. 100% correct 435. 90-100% correct 436. x number correct per min.
When given sets of objects numbering from 1 to 10, the student writes the number which corresponds to each group of objects.	437. 100% correct 440. 90-100% correct 441. x number correct per min.

BC. For each skill stated, RANK the prerequisite skills listed beneath it from easy to difficult (i.e. easy, more difficult, most difficult). Then pick the number which corresponds to the appropriate order.

SKILL

For any two numbers from 0-10 presented in the format $\begin{array}{r}8\\+\,4\\\hline\end{array}$ the student writes the correct answer within 3 seconds.

Prerequisite Skills

A. On the teachers request the student writes all the numerals from 0-20 in order.

B. On the teachers request the student counts orally from 0-20 within 20 seconds

C. As the teacher points to randomly arranged numerals from 0-20 the student says each numeral correctly.

SKILL

When presented any word of 2 syllables or less, having regular sound-symbol correspondence the student says the word correctly within 2 seconds.

Prerequisite Skills

A. When presented a series of letters the student says the sound for each letter without pausing between the sounds.

B. When presented individual letters the student says the sound for each within 1 second.

C. When presented two letters (consonant and vowel) the student says both sounds with no pause between sounds.

BD. Beneath each skill listed, pick the number which corresponds to the assessment procedure and material MOST appropriate to use.

Given all the letters of the alphabet, printed and arranged in random sequence, the student says the letters' sounds.

442. The teacher presents a sheet of paper with the letters of the alphabet and pictures of objects representing each letter. The student draws a line from each letter to the object whose name begins with the letter's sound.

443. The teacher places all alphabet letter cards, in random sequence in rows in front of the student. The student says the letters' sound.

444. The teacher says the name of each letter of the alphabet in random order. For each letter named, the student says the corresponding letter sound.

BD. continued

Given addition problems with numbers 0-9 in the forms $\square + 3 = 7$ and $4 + \square = 6$, the student writes the missing addend for each.

445. The teacher presents a sheet of 10 problems in the forms the student writes the missing addend for each.

$$\begin{array}{r} 4 \\ +\square \\ \hline 6 \end{array} \quad \text{and} \quad \begin{array}{r} \square \\ +\ 7 \\ \hline 9 \end{array}$$

446. The teacher presents a sheet of 10 problems in the form $4 + \square = 8$. The student writes the missing addend for each.

447. The teacher presents a sheet of 10 problems in the forms $3 + \square = 9$ and $\square + 7 = 8$. The student writes the missing addend for each.

Given a list of organs in the digestive system, the student describes in writing the digestive function of each.

450. The teacher presents a list of digestive organs and a list of digestive functions. The student writes the letter of the correct function beside the corresponding digestive organ.

451. The teacher presents a list of digestive organs. For each, the student writes a description of its function in the digestive process.

452. The teacher presents a list of functions of digestive organs. For each, the student must write the name of the corresponding digestive organ.

BE. Choose the phrase which best defines each term.

TERMS	PHRASES
Norm referencing	453. established standard of performance
	454. compares performance of students with other students
	455. indication of future performance
	456. commercially available product
Criterion referencing	457. measures what it says it will measure
	460. established standard of performance
	461. compares performance of students with other students
	462. specified procedures for test administration
	463. indication of future performance
	464. commercially available product
Standardization	465. measures what it says it will measure
	466. the reporting of results
	467. established standard of performance
	470. specified procedures for test administration
	471. indication of future performance
	472. commercially available product
Feedback	473. measures what it says it will measure
	474. the reporting of results
	475. established standard of performance
	476. specified procedures for test administration
Validity	477. measures what it says it will measure
	500. the reporting of results
	501. specified procedures for test administration
	502. consistent scores on successive test administrations
Reliability	503. measures what it says it will measure
	504. specified procedures for test administration
	505. consistent scores on successive test administrations
	506. indication of future performance

CA. A norm referenced test is likely to:

507. be based on local school goals
510. yield comparative data
511. provide diagnostic information
512. have stated performance standards
513. be insensitive to local instructional goals

CB. A characteristic of criterion referenced tests is:

514. reporting of scores as a percentile rank
515. the establishment of a predetermined performance criteria
516. the comparison of a student to a large group of students from another population
517. the lack of specificity of the objectives to be tested
520. none of the above

CC. Select the example(s) of appropriate test items for the following skill statement:

Given written addition problems with two addends of two digits each and no carrying, the student writes the answers.

521. $\begin{array}{r} 43 \\ +\underline{16} \end{array}$

522. $\begin{array}{r} 18 \\ +\underline{23} \end{array}$

523. $\begin{array}{r} 32 \\ 14 \\ +\underline{23} \end{array}$

524. 47 + 63 = ____

525. 24 + 31 = ____

CD. When evaluating criterion referenced tests for use in determining mastery of skills, it is important to consider which of the following?

526. the test score should provide the teacher with the items the student missed
527. the test should be constructed within the last three years
530. the test should require answers similar to those practiced by the student

CE. When evaluating criterion referenced tests for use in assessing skills, it is important to consider which of the following?

531. the test should cover a broad spectrum of items
532. the test should compare the score of the student to those of the other students
533. the test should require answers to problems similar to those which the student will practice
534. the test should take no longer than ten minutes to administer
535. the test should indicate the skills in which the student has deficits

CF. A major concern of a teacher when using a criterion referenced test is that:

536. it match as closely as possible the teacher's instructional plan
537. it be easy for the student to get the answers correct
540. the test cover as broad a range of information as possible
541. it detects the impact of the particular instruction

CG. Order the steps in sequence for the testing of an oral or motor skill. Choose the number which corresponds to the correct order.

__A__ determine whether the student met criteria
__B__ determine the criteria necessary for passing
__C__ specify the student behavior
__D__ observe the student's performance of the behavior

542. B,C,D,A,
543. C,B,D,A,
544. C,D,B,A,
545. none of the above

CH. A written test should include which of the following?

546. directions for administration of the test
547. the standard of performance for passing the test
550. observation of the student behavior
551. a record of the student behavior
552. written test items

CI. Criterion referenced testing is used to:

553. determine the particular skills a student has
554. compare the performance of children
555. determine the effectiveness of the instruction
556. provide normative data on students

CJ. Student performance should be:

557. compared to the performance of another student
560. used to determine program placements
561. based on the previous year's students
562. recorded daily

CK. A written test should be used instead of the observation when:

563. the teacher is too busy to watch every student do the task
564. the skill can be demonstrated by a paper and pencil task
565. it is more efficient to measure the response of the entire group
567. more than 20 students are to be tested

CL. A Student by Task Matrix should be designed to:

570. analyze instructional programs
571. specify the subject matter area for each student for the day
572. record student progress through an instructional plan
573. none of the above

DA. When a classroom is efficiently managed:

574. all children will be working on the same assignment
575. the children learn the information more quickly
576. the teacher is free to work on curriculum and planning
577. the children are responsible for most of their classroom needs

DB. Student performance data (graphs and charts) have several important purposes, including:

600. recording student progress
601. determining the student's program
602. comparing one student with another
603. modifying the instructional program

DC. A classroom should be arranged:

604. so every child faces the front of the room
605. so the teacher and students can move in the room with minimal interference with the work of others
606. with chairs and desks in even rows, allowing for easy discipline
607. so there are few interferences with the use of storage space and outlets

DE. The information recorded on a daily routine matrix should include:

610. the date of student placement
611. each student's daily activities
612. specific instructional materials
613. assemblies, field trips, and special programs
614. the age of the student

DF. As the children in a classroom become responsible for their own instructional management, it is necessary:

615. to remind them to work at their assigned tasks
616. for the teacher to find more work to do
617. to monitor their progress and record keeping
620. to set higher goals for the class
621. for the teacher to instruct fewer children

DG. A daily assignment folder includes which of the following?

622. pen or pencil
623. scratch paper
624. material for recording student progress
625. materials for assignment work
626. a reinforcement activity

DH. For efficient use of the daily assignment folder the student should:

627. store and retrieve his own folder
630. ask the teacher for his folder
631. be the only one to see his folder
632. monitor his own assignments

DI. As much as possible, instructional materials should be managed by:

633. the materials specialist
634. the volunteer aide
635. the teacher
636. the student

DJ. The best source of volunteer help in the classroom is from (only one correct answer)

637. students
640. church groups
641. P.T.A. organizations
642. volunteer organizations

DK. Prerequisite skills for tutors include:

643. above average intelligence
644. good manners
645. reliability
646. clear speech

DL. A volunteer should be trained in:

647. instructional procedures for specific skills
650. the class schedule for the entire day
651. how to keep the student happy about his work
652. writing skills

DM. Effective monitoring of the tutor's work may be done by:

653. direct observation
654. asking the people being tutored
655. checking student progress data
656. asking the tutor

please print
ANSWER SHEET
Date ________________
Full Name ________________________________
School ________________
Course: Sp. Ed. 656 Teaching Exception Children in the Regular Classroom

DIRECTIONS: Since each exam item has a unique set of answer numbers, the item letters (A-DM) are irrelevant and thus are not included on the answer sheet. To record your answers merely CIRCLE each and every answer number which you consider correct. The digits 8 and 9 have been omitted to facilitate machince scoring.

1.
2.
3.
4.
5.
6.
7.
10.
11.
12.
13.
14.
15.
16.
17.
20.
21.
22.
23.
24.
25.
26.
27.
30.
31.
32.
33.
34.
35.
36.
37.
40.
41.
42.
43.
44.
45.
46.
47.
50.
51.
52.
53.
54.
55.
56.
57.
60.
61.
62.
63.
64.
65.
66.
67.
70.
71.
72.
73.
74.
75.
76.
77.
100.
101.
102.
103.
104.
105.
106.
107.
110.
111.
112.
113.
114.
115.
116.
117.
120.
121.
122.
123.
124.
125.
126.
127.
130.
131.
132.
133.
134.
135.
136.
137.
140.
141.
142.
143.
144.
145.
146.
147.
150.
151.
152.
153.
154.
155.
156.
157.
160.
161.
162.
163.
164.
165.
166.
167.
170.
171.
172.
173.
174.
175.
176.
177.
200.
201.
202.
203.
204.
205.
206.
207.
210.
211.
212.
213.
214.
215.
216.
217.
220.
221.
222.
223.
224.
225.
226.
227.
230.
231.
232.
233.
234.
235.
236.
237.
240.
241.
242.
243.
244.
245.
246.
247.
250.
251.
252.
253.
254.
255.
256.
257.
260.
261.
262.
263.
264.
265.
266.
267.
270.
271.
272.
273.
274.
275.
276.
277.
300.
301.
302.
303.
304.
305.
306.
307.
310.
311.
312.
313.
314.
315.
316.
317.
320.
321.
322.
323.
324.
325.
326.
327.
330.
331.
332.
333.
334.
335.
336.
337.
340.
341.
342.
343.
344.
345.
346.
347.
350.
351.
352.
353.
354.
355.
356.
357.
360.
361.
362.
363.
364.
365.
366.
367.
370.
371.
372.
373.
374.
375.
376.
377.
400.
401.
402.
403.
404.
405.
406.
407.
410.
411.
412.
413.
414.
415.
416.
417.
420.
421.
422.
423.
424.
425.
426.
427.
430.
431.
432.
433.
434.
435.
436.
437.
440.
441.
442.
443.
444.
445.
446.
447.
450.
451.
452.
453.
454.
455.
456.
457.
460.
461.
462.
463.
464.
465.
466.
467.
470.
471.
472.
473.
474.
475.
476.
477.
500.
501.
502.
503.
504.
505.
506.
507.
510.
511.
512.
513.
514.
515.
516.
517.
520.
521.
522.
523.
524.
525.
526.
527.
530.
531.
532.
533.
534.
535.
536.
537.
540.
541.
542.
543.
544.
545.
546.
547.
550.
551.
552.
553.
554.
555.
556.
557.
560.
561.
562.
563.
564.
565.
566.
567.
570.
571.
572.
573.
574.
575.
576.
577.
600.
601.
602.
603.
604.
605.
606.
607.
610.
611.
612.
613.
614.
615.
616.
617.
620.
621.
622.
623.
624.
625.
626.
627.
630.
631.
632.
633.
634.
635.
636.
637.
640.
641.
642.
643.
644.
645.
646.
647.
650.
651.
652.
653.
654.
655.
656.
657.
660.
661.
662.
663.
664.
665.
666.
667.

Item BC. page 13
First Skill
670. ABC
671. ACB
672. BAC
673. BCA
674. CAB
675. CBA

Item BC. page 13
Second Skill
700. ABC
701. ACB
702. BAC
703. BCA
704. CAB
705. CBA

Appendix E

Criterion Referenced Test and Answer Sheet for

"Instructional Materials: How to Analyze, Adapt, Select, and Develop"

Final Exam Sp. Ed. 640

Course: Instructional Materials: How to Analyze, Adapt, Select and Develop.

On this multiple choice exam each question may have any number of correct answers. There may be only one correct answer, more than one correct answer or even all correct answers among the choices given. On the answer sheet circle all numbers that correspond to correct choices. Singular nouns, verbs and adjectives do not necessarily indicate a single correct answer, nor do plural nouns, verbs and adjectives necessarily indicate more than one correct answer. Try to determine whether each choice is correct independent of the other choices given. Because you have picked a correct answer already does not mean that the others can be eliminated as in the usual multiple choice test.

Please keep in mind that the answers should be made according to the instructional material you used in the course, whether or not you agree with all of it.

Please do not mark on the test. Record answers on the answer sheet provided.

If you have any questions, please ask them now. You may begin when you are ready. You have up to an hour and a half should you need it.

TEST

Course: Instructional Materials: How to Analyze, Adapt, Select and Develop

A. Which of the following skills should teachers have with respect to instructional materials?

1. evaluation
2. distribution
3. development
4. selection
5. production
6. adaptation
7. marketing
10. none of the above

B. Decisions about instructional materials should be directly related to:

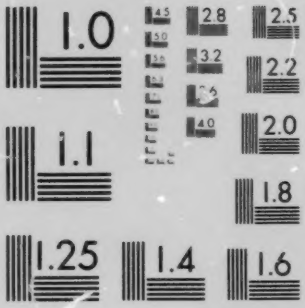
11. the learner's behavior
12. the district policy
13. the instructional objectives
14. the date of publication
15. the use of innovative media
16. the principal's opinion
17. the superintendent's opinion
20. the materials committee's opinion
21. none of the above

C. Jeanne Chall's (1967) five year study of the effectiveness of different approaches to beginning reading instruction concluded that:

22. the code emphasis was superior in general
23. the meaning emphasis was superior in general
24. a combination of the meaning and code emphasis was superior in general
25. the code emphasis was superior for "slow" students
26. the meaning emphasis was superior for "slow" students
27. a combination of the code and meaning emphasis was superior for "slow" students
30. "slow" students need more oral reading practice
31. "slow" students need more silent reading practice
32. "lack of interest" is a cause of reading difficulty
33. reading difficulty and "lack of interest" are unrelated

D. What are the four critical elements to be attended to in analyzing instructional materials?

34. stimulus
35. response
36. publisher
37. date of publication
40. practice
41. assessment
42. examples
43. illustrations
44. color utilization
45. format
46. one or more of the four elements is not listed


1.0
4.5
5.0
5.6
2.8
2.5
3.2
2.2
3.6
4.0
2.0
1.1
1.8
1.25
1.4
1.6

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

E. Reasons for integrating handicapped students into the regular classroom are:

47. there are too few special education teachers
50. both parents and children have perceived placement in special education programs as a kind of labeling
51. regular education students will get the opportunity to meet special education students
52. special education classes are no more effective than regular classes as far as academic achievement is concerned.
53. recent development of instructional materials and techiques make it possible to effectively individualize educational programs.

F. Which of the following would be deemed the least restrictive alternative for the education of mildly and moderately retarded students?

54. an open-classroom
55. a self-contained special education classroom
56. a classroom in a pod setting
57. a resource room which takes major responsibility for the student's education
60. a regular education classroom

G. When analyzing instructional materials "stimulus" refers to:

61. techniques used for motivating the student
62. the materials and/or command which are presented to the student
63. a method for prompting or giving cues to the student
64. the first word of the teacher's verbal command

H. When analyzing instructional materials which of the following questions would you ask regarding the RESPONSE called for:

65. What material is required?
66. Is the material and/or teacher instructions provided the same as the material and/or instructions specified in the skill statement?
67. What observable behavior is required for the skill?
70. Are mastery criteria specified?
71. Is the observable behavior required by this material the same as that required for the skill?
72. Is the student required to say it, write it, or make it?
73. What material is provided in the student's workbook?

I. When analyzing instructional materials which of the following questions would you ask regarding the STIMULUS which is provided:

74. Are mastery criteria specified?
75. Does the practice material appear to be sufficient?
76. What material is required?
77. What material is provided in the students' workbooks?
100. Is the material provided the same as the material specified in the skill statement?
101. Is the behavior the student is to exhibit the same as that specified in the skill statement?
102. Are the procedures for assessing student achievement specified?
103. Are the mastery criteria specified?

J. When analyzing instructional materials which of the following questions would you ask regarding ASSESSMENT of the student?

104. Is the observable student behavior required by this material the same as that required for the skill?
105. Is the student required to say it, write it, or make it?
106. Do the teacher's material or the student's materials specify procedures for initial placement?
107. Do the teacher's materials or the student's material specify procedures for measurement of daily progress?
110. Are the materials for practice the same as in the skill statement?
111. Are mastery criteria specified?

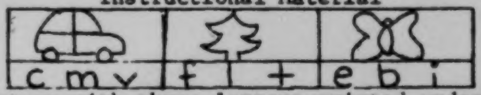
K. When analyzing instructional materials which of the following questions would you ask regarding the PRACTICE provided for the student?

112. Is the observable behavior required by this material the same as that required for the skill?
113. Do the teacher materials or the student materials specify procedures for initial placement?
114. Are materials for practicing skills provided?
115. Are the stimuli and response items provided in the practice materials the same as those provided in the materials used for initial instruction?
116. Are there enough practice materials provided?

L. Given this skill statement (i.e. objective) analyze the "material" to follow; pick the numbered choice(s) which correctly analyze the material.

SKILL STATEMENT: Given letters, representing sounds, printed on individual cards, presented one at a time, the student orally reads the correct sound in two seconds or less with 100% accuracy.

Instructional Material



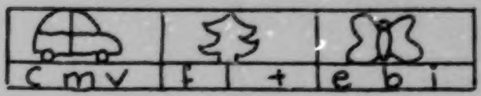
Stimulus: A picture with three letters printed under the picture.
Response: Student says the name of the picture, then circles the letter which the name of the picture begins with.
Assessment: Student circles the correct letter.
Practice: Several worksheets with the same type of stimulus-response items as above, but using different pictures for examples.

---

117. this material meets the objectives given in the skill statement
120. this material does not meet the objectives given in the skill statement
121. the stimulus-response items in this material are the same as those specified in the skill statement
122. the stimulus-response items in this material are not the same as those specified in the skill statement
123. the assessment procedures are specified
124. the assessment procedures are not specified
125. the mastery criteria are specified
126. the mastery criteria are not specified
127. the practice exercises are the same as the instructional activities
130. the practice exercises are not the same as the instructional activities

SKILL STATEMENT: Given letters, representing sounds, printed on individual cards, presented one at a time, the student orally reads the correct sound in two seconds or less with 100% accuracy.

Instructional Material



Stimulus: A picture with three letters printed under the picture.
Response: Student says the name of the picture, then circles the letter which the name of the picture begins with.
Assessment: Student circles the correct letter.
Practice: Several worksheets with the same type of stimulus-response items as above, but using different pictures for examples.

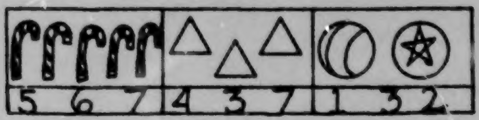
M. Which of the following, if any, adaptations (additions and/or deletions) would be necessary so that the above instructional materials would meet the specifications given in the skill statement.

131. the letters under the pictures should be changed so that they are all consonants or all vowels
132. the letters under the pictures should be capitals
133. the pictures should be removed from the cards
134. there should be only one sound on each card
135. the teacher should say the name of the picture and have the student circle the correct letter
136. the student should say the name of the picture and circle the correct letter
137. the teacher should say the name of the picture and the student should say the name of the beginning letter
140. the student should say the sound for the letter
141. the student should cross out all the incorrect answers and circle the correct letter
142. assessment criteria for mastery should state that the student must say the sounds with 100% accuracy
143. assessment criteria for mastery should state that the student must circle the correct letters within 2 seconds, with 100% accuracy
144. assessment criteria for mastery should state that the student must say the sounds within 2 seconds with 100% accuracy.
145. practice should consist of the student having several worksheets on which he is to circle the correct letter after having said the name of the picture
146. practice should consist of the student saying the sound for each letter
147. the instructional materials above are appropriate and there is no need to make any of the suggested adaptations (changes)

N. Given the skill statement (i.e. objective) analyze the "materials" to follow; pick the numbered choice(s) which correctly analyze the material.

SKILL STATEMENT: Given numerals from 0 to 9 printed on individual cards, presented in random order. The student orally reads each numeral within one second each with 100% accuracy.

Instructional Material



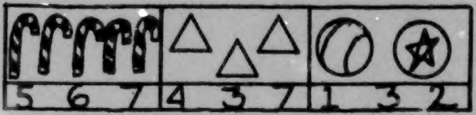
Stimulus: Pictures of sets of 0-9 objects and corresponding numerals.
Response: The pupil circles the number for each set.
Assessment: The student circles the correct number.
Practice: Several worksheets with the same type of stimulus-response items as above but using different pictures for examples.

---

150. this material meets the objectives given in the skill statement
151. this material does not meet the objectives given in the skill statement
152. the stimulus-response items in this material are the same as those specified in the skill statement
153. the stimulus-response items in this material are not the same as those specified in the skill statement
154. the assessment procedures are appropriate
155. the assessment procedures are not appropriate
156. the practice exercises are the same as the instructional activities
157. the practice exercises are not the same as the instructional activities

SKILL STATEMENT: Given numerals from 0 to 9 printed on individual cards, presented in random order. The student orally reads each numeral within one second each with 100% accuracy.

Instructional Material



Stimulus:	Pictures of sets of 0-9 objects and corresponding numerals.
Response:	The pupil circles the number for each set.
Assessment:	The student circles the correct number.
Practice:	Several worksheets with the same type of stimulus-response items as above but using different pictures for examples.

---

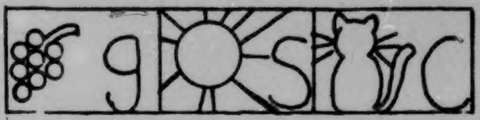
0. Which of the following, if any, adaptations (additions and/or deletions) would be necessary so that the above instructional materials would meet the specifications given in the skill statement.

160. the pictures of sets of objects are directed towards an immature population and should be changed
161. the numerals should be printed on individual cards
162. the sets of objects should be printed on individual cards
163. the student should say the number
164. the student should first count the number of objects and then say the number
165. the student should first count the objects and then circle the correct numeral
166. the student should be assessed on circling the correct number within one second
167. the student should be assessed on saying each numeral with 100% accuracy
170. the student should be assessed on counting the sets of objects and circling the corresponding number with 100% accuracy.
171. the student should be assessed on saying the correct numeral within one second of the presentation with 100% accuracy
172. mastery criteria should state both rate and accuracy
173. mastery criteria should be concerned with rate only
174. practice should consist of the student having several worksheets on which he is to circle the correct numeral which corresponds to the number of objects counted
175. the instructional materials above are appropriate and there is no need to make any of the suggested adaptations (changes)

P. Given this skill statement (i.e. objective) analyze the "material" to follow; pick the numbered choice(s) which correctly analyze the material.

SKILL STATEMENT: Given letters, representing sounds, printed on individual cards, presented one at a time, the student orally reads the correct sound in two seconds or less.

Instructional Material



Stimulus: Individual cards with a picture and a letter printed on them. Student is told that the sound for the letter is the same as the beginning sound of the name for the picture.

Response: Student says the name of the picture and then says the sound for the letter.

Assessment: Student says the correct name for the picture. Student says the correct sound.

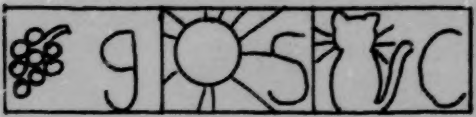
Practice: Student practices saying the names of each picture and the sound printed on each card.

---

176. this material meets the objectives given in the skill statement
177. this material does not meet the objectives given in the skill statement
200. the stimulus-response items in this material are the same as those specified in the skill statement
201. the stimulus-response items in this material are not the same as those specified in the skill statement
202. there are irrelevant responses called for
203. the responses called for are appropriate
204. the procedure for assessing the student is appropriate
205. the student is assessed on irrelevant skills
206. criteria for mastery is stated
207. criteria for mastery is not stated

SKILL STATEMENT: Given letters, representing sounds, printed on individual cards, presented one at a time, the student orally reads the correct sound in two seconds or less.

Instructional Material



Stimulus: Individual cards with a picture and a letter printed on them. Student is told that the sound for the letter is the same as the beginning sound of the name for the picture.

Response: Student says the name of the picture and then says the sound for the letter.

Assessment: Student says the correct name for the picture. Student says the correct sound.

Practice: Student practices saying the names of each picture and the sound printed on each card.

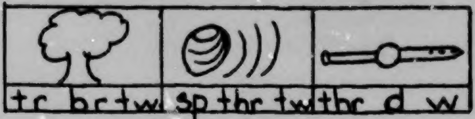
Q. Which of the following, if any, adaptation (additions and/or deletions) would be necessary so that the above instructional material would meet the specifications given in the skill statement.

210. the pictures on the cards are ambiguous and should be changed, for example, the picture of "grapes" may be mistaken for "fruit" and should be changed to a "goat"
211. the letters should be removed from the cards
212. each card should have a letter on it without the picture.
213. the student should be required to say the name of the picture and then the name of the letter
214. the student should say the letter name only
215. the student should say the sound for the letter only
216. the student should say the letter name and the sound for the letter
217. the student should only be assessed on saying the correct name of the picture
220. the student should be assessed on saying the correct name of the picture and the correct letter name
221. the student should be assessed on saying the correct letter name and the correct sound
222. the student should be assessed on saying the correct sound
223. the criteria for mastery should be 100% accuracy
224. the criteria for mastery should be 100% accuracy and saying the sound within 2 seconds or less of the presentation
225. the instructional materials above are appropriate and there is no need to make any of the suggested adaptation (changes)

R. Given this skill statement (i.e. objective) analyze the "material" to follow; pick the numbered choice(s) which correctly analyze the material.

SKILL STATEMENT: Given letters, representing sounds printed on individual cards presented all at once in random order; the student orally reads the correct sound in the order presented, at a rate of 120 sounds per minute.

Instructional Material



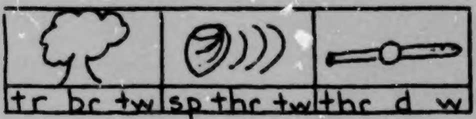
Stimulus: A picture with three blends printed under the picture.
Response: Student says the name of the picture, then circles the blend that the name of the picture begins with.
Assessment: The student circles the correct blend.
Practice: Several worksheets with the same types of stimulus-response items as above, but using different pictures for examples.

---

226. this material meets the objectives given in the skill statement
227. this material does not meet the objectives given in the skill statement
230. the circling response which the student is required to make is an appropriate response.
231. the circling response the student is required to make is an inappropriate response
232. the assessment procedure is adequate
233. the assessment procedure is inadequate
234. mastery criteria are stated
235. mastery criteria are not stated
236. the practice exercises are the same as the instructional activities
237. the practice exercises are not the same as the instructional activities

SKILL STATEMENT: Given letters, representing sounds printed on individual cards presented all at once in random order; the student orally reads the correct sound in order presented, at a rate of 120 sounds per minute.

Instructional Material



Stimulus:	A picture with three blends printed under the picture.
Response:	Student says the name of the picture, then circles the blend that the name of the picture begins with.
Assessment:	The student circles the correct blend.
Practice:	Several worksheets with the same types of [illegible]-response items as above, but using different pictures f[illegible]amples.

S. Which of the following, if any, adaptation (additions and/or deletions) would be necessary so that the above instructional material would meet the specifications given in the skill statement.

240. there are too many letters under the picture, there should only be two blends rather than three
241. there should only be letters for one sound on each card
242. the student should be required to say each of the two letter blends as a single sound
243. the student should say each of the sounds, which are printed on individual cards presented all at once as rapidly as possible, up to 120 sounds per minute
244. 100% accuracy is sufficient criteria for mastery
245. both rate and accuracy should be included in criteria for mastery
246. during practice, rate alone should be stressed
247. practice should have both rate and accuracy as mastery criteria

T. Given this skill statement (i.e. objective) analyze the "material" to follow; pick the numbered choice(s) which correctly analyze the material.

SKILL STATEMENT: Given addition problems printed in the form: (0 to 9)+ 1=, the student writes the sum to each problem at a rate of 40 digits per minute with 100% accuracy.

Instructional Material

8+1=☐	5+1=☐	3+1=☐

Stimulus:	Printed addition equations.
Response:	Student writes the solution to the problem.
Assessment:	The student writes the correct sums at a rate of 40 digits per minute with 100% accuracy.
Practice:	Several worksheets with the same type of stimulus-response items as above.

---

250. this material meets the objectives given in the skill statement
251. this material does not meet the objectives given in the skill statement
252. the stimulus-response items in this material are the same as those specified in the skill statement
253. the stimulus-response items in this material are not the same as those specified in the skill statement
254. the assessment procedures are specified
255. the assessment procedures are not specified
256. mastery criteria are specified
257. mastery criteria are not specified

SKILL STATEMENT: Given addition problems printed in the form: (0 to 9)+1 =, the student writes the sum to each problem at a rate of 40 digits per minute with 100% accuracy.

Instructional Material

8+1=☐	5+1=☐	3+1=☐

Stimulus: Printed addition equations.
Response: Student writes the solution to the problem.
Assessment: The student writes the correct sums at a rate of 40 digits per minute with 100% accuracy.
Practice: Several worksheets with the same type of stimulus-response items as above.

U. Which of the following, if any, adaptations (additions and/or deletions) would be necessary so that the above instructional materials would meet the specifications given in the skill statement.

260. the student should be provided with some prompts or instructional aids such as pictures or lines etc. to aid and guide the student in the plussing process.
261. the student should orally recite the entire problem and the solution and then write the solution
262. the problems should be presented on individual cards one at a time
263. the student should be able to demonstrate the solution to each problem with a show of fingers first and then write the solution
264. the student should first draw the correct number of lines to correspond with each part of the addition problem and then write the solution
265. the student should only be assessed on writing the correct sums to each problem with 100% accuracy
266. the student should be assessed on drawing the correct number of lines for each part of the addition problem and writing the correct solution
267. the student should be assessed on rate only
270. mastery criteria should only state the degree of accuracy necessary for proficiency
271. mastery criteria should state 100% accuracy only
272. practice should consist of several worksheets with the same type of stimulus-response items as above on which the student may draw lines or use a number line etc. to come to the correct solution for each problem
273. the instructional materials above are appropriate and there is no need to make any of the suggested adaptations (changes)

V. Which of the following need not be included when writing an instructional procedure?

274. method for teaching unknown skills
275. designing instructional materials
276. measuring daily progress
277. practice procedures

W. Why is it critical to measure a student's daily progress?

300. so that the student will be able to check how well he is doing at least once every week
301. the teacher will be able to determine grades more easily
302. the student knows how well he is doing every day
303. it lets the teacher know whether his/her teaching is effective

X. Measurement of daily progress need only include accuracy when:

304. the student response for each item is of approximately the same difficulty and length
305. each item is presented one at a time
306. items are all presented at the same time
307. the student responses are of unequal length

Y. Which of the following are included in the management of instructional materials?

310. record keeping procedures
311. selection of instructional materials
312. storage and retrieval systems for materials and records
313. teaching procedures
314. specification of teacher and student responsibilities

Z. Some of the things a teacher may do to improve the efficiency of a classroom management system are:

315. pass out materials and file folders to each student
316. record each student's rate or score
317. teach new skills
320. collects and puts away materials and file folders
321. monitor the timings which are recorded

AA. The purpose of materials used for initial instruction is:

322. to provide the student with sufficient practice materials
323. to test the student on prerequisite skills
324. to introduce new concepts
325. to insure mastery of a particular skill

AB. What are the characteristics of a good mathematics program:

326. exact instructions for the teacher's presentation are given
327. general instructions for teacher presentation of mathematical concepts are provided
330. mastery of prerequisite skills before going on to a new more complicated skill is required
331. presents the entire concept all at once
332. breaks-down concepts into smaller tasks
333. provides materials for both initial instruction and practice
334. specifies both accuracy and rate as a criterion for skill mastery
335. specifies only accuracy as a criterion for skill mastery

AC. A general (preliminary) screening of instructional materials should include:

336. a description of the students for whom you are selecting materials
337. a tally of the number of pages provided for independent work
340. a general idea of the types of books and worksheets etc. which the students favor most
341. specifications of how the materials are to be used

AD. Formal procedures for screening instructional materials should include:

342. consideration of the students background and interests
343. analysis of the instructional materials, that is, what stimulus, response, assessment and practice are provided
344. if the student materials are hardback or softbound
345. determining how extensive adaptations would be
346. determining the cost of the materials needed for adaptations
347. estimating the cost of adaptations in terms or man-hours

AE. Decisions to develop or not to develop instructional materials should be determined by which of the following:

350. develop only game materials
351. develop instructional materials only
352. develop only those materials which you do not wish to buy
353. develop materials only for those critical skills that are taught frequently
354. develop materials for which adequate material is not available

AF. An efficient procedure for developing instructional materials would be, (1) Select the subject area, (2) Specify the range of skills to be covered, (3) Construct or obtain instructional materials for each step, (4) Develop a management system.

Sequence each of the remaining steps (listed below) for developing instructional materials.

a revise the program at points of difficulty
b try out the program
c have other teacher try out the program
d make final revisions
e keep track of pupil performance
f try out the revised program

355. a b c e f d
356. b e a f c d
357. c b a e d f

AG. In developing materials, revisions should be based on which of the following:

360. student opinion
361. teacher opinion
362. data which has been collected on the first try out
363. teacher observation
364. decisions concerning which materials will be easier to make and duplicate

please print

ANSWER SHEET

Date ______________

Full Name ______________________________________

School ______________

Course: Sp. Ed. Instructional Materials: How to Analyze, Adapt, Select, and Develop.

DIRECTIONS: Since each exam item has an unique set of anser numbers, the item letters (A-AG) are irrelevant and thus are not included on the answer sheet. To record your answers merely CIRCLE each and every answer number which you consider correct. The digits 8 and 9 have been omitted to facilitate machine scoring.

1.
2.
3.
4.
5.
6.
7.
10.
11.
12.
13.
14.
15.
16.
17.
20.
21.
22.
23.
24.
25.
26.
27.
30.
31.

32.
33.
34.
35.
36.
37.
40.
41.
42.
43.
44.
45.
46.
47.
50.
51.
52.
53.
54.
55.
56.
57.
60.
61.
62.

63.
64.
65.
66.
67.
70.
71.
72.
73.
74.
75.
76.
77.
100.
101.
102.
103.
104.
105.
106.
107.
110.
111.
112.
113.

114.
115.
116.
117.
120.
121.
122.
123.
124.
125.
126.
127.
130.
131.
132.
133.
134.
135.
136.
137.
140.
141.
142.
143.
144.

145.
146.
147.
150.
151.
152.
153.
154.
155.
156.
157.
160.
161.
162.
163.
164.
165.
166.
167.
170.
171.
172.
173.
174.
175.

176.
177.
200.
201.
202.
203.
204.
205.
206.
207.
210.
211.
212.
213.
214.
215.
216.
217.
220.
221.
222.
223.
224.
225.
226.

227.
230.
231.
232.
233.
234.
235.
236.
237.
240.
241.
242.
243.
244.
245.
246.
247.
250.
251.
252.
253.
254.
255.
256.
257.

260.
262.
263.
264.
265.
266.
270.
271.
272.
273.
274.
275.
300.
301.
302.
303.
304.
305.
306.
307.
310.
311.
312.
313.
314.

315.
316.
317.
320.
321.
322.
323.
324.
325.
326.
327.
330.
331.
332.
333.
334.
335.
336.
337.
340.
341.
342.
343.
344.
345.

346.
347.
350.
351.
352.
353.
354.
355.
356.
357.
360.
361.
362.
363.
364.

Appendix F

Classroom Observation and Recording Form

CLASSROOM OBSERVATION FORM

Teacher________________________ School________________________ Grade(s)__________ Date__________

Observer's Name________________________ Students enrolled (N)________________________ Students present (n)__________

Activity (subject matter)________________________________ Method of Presentation__________

Time: Stop__________	Stop__________	Stop__________
Start__________	Start__________	Start__________
Elapsed__________	Elapsed__________	Elapsed__________
		Total Elapsed (t)__________

Positive teacher response to student behavior (tally):

RATE (#/min.): PV____ PNV____

P1 _____Positive Verbal:________________________________

P2 _____Positive Non-Verbal:________________________________

Time: Stop__________	Stop__________	Stop__________
Start__________	Start__________	Start__________
Elapsed__________	Elapsed__________	Elapsed__________
		Total Elapsed (t)__________

Inappropriate Student Behaviors with Teacher Reaction:

TALK-OUTS: appropriate ☐ None ☐ Specified but not on List ☐
inappropriate ☐ Other (specify)________________________________

RATE (#/min.): PIB____ VTR____ NVTR____ NTR____

IT1_____Pupil inappropriate behavior
IT2_____Verbal teacher response
IT3_____Non-verbal teacher response
_____No teacher response

Pupil inappropriate behavior
Verbal teacher response
Non-verbal teacher response
No teacher response

Time: Stop__________	Stop__________	Stop__________
Start__________	Start__________	Start__________
Elapsed__________	Elapsed__________	Elapsed__________
		Total Elapsed (t)__________

OUT-OF-SEAT: appropriate ☐ None ☐ Specified but not on List ☐
inappropriate ☐ Other (specify)________________________________

RATE (#/min.): PIB____ VTR____ NVTR____ NTR____

IO1_____Pupil inappropriate behavior
IO2_____Verbal teacher response
IO3_____Non-verbal teacher response
_____No teacher response

Pupil inappropriate behavior
Verbal teacher response
Non-Verbal teacher response
No teacher response

CLASSROOM RECORDING FORM

When you enter the classroom, ask the teacher the following questions:

1. Do you have any graphs or charts that you use to show student progress? If yes: May I look at them? ______________________________

   ____

2. Do you use a reinforcement or reward system with your students? If yes: What kind of reinforcers or rewards do you use? If activities or free time: Do you have a written list or can you show me those activities? If yes to first question of sequence: How many of these reinforcers or rewards are used by students? ____________

   ____

   ____

3. If yes on question 2: Do you have a chart or table that you use to determine how much reinforcement or reward students get? If yes: May I see it? ______________________________________

   ____

4. Do you have a sequence of objectives written for a subject matter area? If yes: May I see them? ____________________________

   ____

   ____

5. Do you have a chart or table which shows student progress through a sequence of objectives or tasks? If yes: What are the criteria for mastery? May I see it? ______________________________

   ____

6. Do you have a daily schedule which indicates what all students do during the school day? If yes: May I see it? ____________

   ____

   ____

7. Do you have a filing system for supplemental materials? If yes: For what subjects? Where is it located? ______________

   ____

8. Do you have folders for each student which contain the student's assignments? If yes: May I see them? ____________________

____

____

Tutors

Total number of tutors used: T1 (x)____________________

Volunteer Adults________

Paid Adults____________

Volunteer Students__________

Paid Students____________

Average Number of Minutes per Day spent in tutoring by all tutors

T1 (time:minutes)______________

Volunteer Adult__________

Paid Adults____________

Volunteer Students________

Paid Students__________

Total Number of Students enrolled in the class:

T1 (n)________________

Record the following data from the materials collected from the teacher (the teacher need not be present):

Graphs (at least one for at least five days)

A. Baseline data

Total number of graphs used in the classroom B1 _____
Total number of graphs with correct statement(s) of pupil behavior B2 _____
Total number of graphs using appropriate measurement for stated pupil behavior B3 _____
Total number of graphs using correct graphing procedures
- a. the behavior measured with its units on the left, B4 _____
- b. the time (days) on the bottom, and B5 _____
- c. dots (data points) plotted correctly. B6 _____

B. Continuation data

Total number of graphs used CD1 _____
Total number of graphs meeting baseline criteria (see above) CD2 _____
Total number of graphs with vertical line separating baseline from treatment CD3 _____
Total number of graphs with baseline and treatment labeled correctly CD4 _____

Reinforcers

Total number of different designated reinforcers in classroom R1 _____
Total number of different reinforcers which the teacher says have been used by the students R2 _____

Contingency Table

Total number of subject areas with contingency tables CT1 _____
Number of students on each table out of those eligible CT2 _____
Total number of contingency tables meeting the following criteria:
- a. students' names on one axis CT3 _____
- b. contingencies specified on the other axis, and CT4 _____
- c. required amounts of behavior specified for each student CT5 _____

Instructional Plan

Total number of subject areas with instructional plans IP1 _____
Total number of instructional plans meeting the following criteria:
- a. objectives are sequenced IP2 _____
- b. all objectives are observable, measurable, & verifiable IP3 _____
- c. criteria for mastery is specified for all objectives IP4 _____

COMMENTS: ____

____

Student by Task Matrix

Total number of matrices STM1 _____
Total number of matrices meeting the following criteria:
  a. all student names generally in alphabetical order on one axis STM2 _____
  b. objectives listed on the other axis, and STM3 _____
  c. evidence of use of matrices for individualized instruction STM4 _____

Daily Routine Matrix

Total number of daily routine matrices DRM1 _____
Total number of matrices meeting the following criteria
  a. all student names generally in alphabetical order on one axis DRM2 _____
  b. time blocks listed on the other axis, and DRM3 _____
  c. all time blocks list an activity DRM4 _____

Filing System

Total number of subject areas with supplemental materials filed FS1 _____
Total number of subject areas with supplemental materials filed meeting the following criteria:
  a. major headings are specified FS2 _____
  b. materials are in folders FS3 _____
  c. folders are sequenced FS4 _____
  d. folders are labeled FS5 _____

Individual Assignment Folders

Total number of individual assignment folders IAF1 _____
Total number of folders meeting the following criteria:
  a. assignment sheet on front of folder up-to-date with assignments recorded for at least five days IAF2 _____
  b. assignment inside folder IAF3 _____
  c. provision for immediate checking of assignments IAF4 _____
  d. provision for recording completed assignments IAF5 _____

COMMENTS: ____

____

____

____

____

____

Appendix G

Teacher Inventory

TEACHER INVENTORY

Name_____________________

School___________________

Date_____________________

Instructions

This inventory will ask you to rate your satisfaction and effectiveness in various areas on a scale ranging from 1 to 5 or 6. In using this scale you may specify any number indicated. Pay particular attention to each item as you respond to the items as the best choice is not always located in the same place for each item. Please do not skip items which are applicable but are, for one reason or another, difficult to rate.

NOTICE

1. The information that you supply will be seen by only our research staff. No one else will have access to it. These forms will be destroyed after they have been tabulated.
2. This information will only be used in the evaluation of this project. Your name is necessary on this information in order to determine the relation between your history and your success in this course.

Name ______________________

A. Rate your satisfaction with each of the following by circling the closest number:

Your employment

best job   worst job

5 - - - - - 4 - - - - - 3 - - - - - 2 - - - - - 1

Your students

best students   worst students

5 - - - - - 4 - - - - - 3 - - - - - 2 - - - - - 1

Administrators in your school

worst administrators   best administrators

1 - - - - - 2 - - - - - 3 - - - - - 4 - - - - - 5 - - - - - 6

Faculty in your school

best faculty   worst faculty

6 - - - - - 5 - - - - - 4 - - - - - 3 - - - - - 2 - - - - - 1

Your equipment and supplies

worst equipment and supplies   best equipment and supplies

1 - - - - - 2 - - - - - 3 - - - - - 4 - - - - - 5

Textbooks

appropriate textbooks for grade level   inappropriate textbooks for grade level

6 - - - - - 5 - - - - - 4 - - - - - 3 - - - - - 2 - - - - - 1

The Grade You Presently Teach is

best grade to teach   worst grade to teach

6 - - - - - 5 - - - - - 4 - - - - - 3 - - - - - 2 - - - - - 1

Name ______________________

B. Rate your teaching effectiveness in each of the following subject areas by circling the closest number:

	excellent	very good	good	fair	weak
1. Reading	5 - - - - -	4 - - - - -	3 - - - - -	2 - - - - -	1
2. Arithmetic	5 - - - - -	4 - - - - -	3 - - - - -	2 - - - - -	1
3. Spelling	5 - - - - -	4 - - - - -	3 - - - - -	2 - - - - -	1
4. Language Arts	5 - - - - -	4 - - - - -	3 - - - - -	2 - - - - -	1
5. Social Studies	5 - - - - -	4 - - - - -	3 - - - - -	2 - - - - -	1
6. Health	5 - - - - -	4 - - - - -	3 - - - - -	2 - - - - -	1
7. Science	5 - - - - -	4 - - - - -	3 - - - - -	2 - - - - -	1
8. Music	5 - - - - -	4 - - - - -	3 - - - - -	2 - - - - -	1
9. Art	5 - - - - -	4 - - - - -	3 - - - - -	2 - - - - -	1
10. Physical Education	5 - - - - -	4 - - - - -	3 - - - - -	2 - - - - -	1
11. Other (specify)	5 - - - - -	4 - - - - -	3 - - - - -	2 - - - - -	1

C. Specify the percentage of students you feel you teach effectively in each of the following subject areas:

	Percentage
Reading	________%
Arithmetic	________%
Spelling	________%
Language Arts	________%
Social Studies	________%
Health	________%
Science	________%
Music	________%
Art	________%
Physical Education	________%
Other (specify)	________%

D. Outside Time Investment

Estimate the amount of time each day (i.e. not during working hours) that you spend in preparation for the next day's teaching. ______________________

Appendix H

Raw Data for Criterion Referenced Tests for "Teaching Exceptional Children in the Regular Classroom" and "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

Experimental Group: Raw Data for "Teaching Exceptional Children in the Regular Classroom"

SCHOOL	N	ERRORS OF COMMISSION	ERRORS OF OMISSION
1	3	16.333	27.333
2	1	22.000	29.000
3	1	23.000	19.000
4	1	35.000	39.000
5	3	44.667	35.667
6	2	55.000	25.500
7	2	55.000	44.500
8	5	49.600	43.600
9	4	37.750	29.500
10	2	55.500	57.000
11	2	39.000	35.000
12	2	33.500	54.500
13	1	49.000	29.000
14	6	36.833	35.000
X̄		39.5714	34.5000
SD		12.9301	7.9783

Control Group: Raw Data for "Teaching Exceptional Children in the Regular Classroom"

SCHOOL	N	ERRORS OF COMMISSION	ERRORS OF OMISSION
15	2	53.500	65.000
16	5	55.800	73.000
17	2	33.500	64.000
18	1	46.000	50.000
19	8	70.250	61.625
20	5	74.800	53.200
21	5	66.600	54.600
22	12	68.333	60.167
23	3	76.333	48.000
24	4	73.000	49.500
25	1	63.000	80.000
26	1	69.000	39.000
27	1	57.000	78.000
28	1	51.000	72.000
29	1	68.000	31.000
30	5	74.600	62.800
31	3	66.333	63.000
X̄		62.8235	56.9412
SD		11.6095	4.4084

Experimental Group: Raw Data for "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

SCHOOL	N	ERRORS OF COMMISSION	ERRORS OF OMISSION
1	3	15.000	5.000
2	1	17.000	10.000
3	1	13.000	7.000
5	2	20.500	14.000
6	1	23.000	13.000
7	1	34.000	21.000
8	2	30.000	13.000
9	3	16.667	6.333
12	2	24.000	9.500
13	1	15.000	13.000
X̄		20.3000	10.2000
SD		4.6440	3.2249

Control Group: Raw Data for "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

SCHOOL	N	ERRORS OF COMMISSION	ERRORS OF OMISSION
15	2	44.000	25.000
16	5	49.800	30.400
17	2	36.500	14.000
19	8	33.250	37.500
20	4	26.000	29.750
22	11	31.636	38.000
23	2	44.000	49.000
25	1	35.000	32.000
27	1	21.000	35.000
28	1	43.000	36.000
30	4	40.750	48.250
31	3	43.667	42.333
X̄		39.4000	27.2000
SD		7.9174	16.1298

Appendix I

Raw Data for Classroom Observation and Recording Form: Observation Section

Classroom Observation and Recording Form:

Mean Scores for Experimental Schools *

SCHOOL	N	S ENROLLED	S PRESENT	POSITIVE VERBAL	POSITIVE NON-VERB	TE-TIME	IT-1	IT-2	IT-3	TE-TIME	IO-1	IO-2	IO-3	TE-TIME
1	3	16.666	15.333	9.666	2.000	27.666	65.000	9.000	1.000	25.333	27.333	1.000	0.333	27.666
2	1	5.000	5.000	14.000	0.000	40.000	34.000	0.000	0.000	40.000	18.000	0.000	0.000	40.000
3	1	16.000	16.000	10.000	1.000	32.000	1.000	0.000	0.000	32.000	28.000	0.000	0.000	32.000
4	1	20.000	20.000	2.000	1.000	28.000	76.000	1.000	0.000	28.000	24.000	2.000	0.000	28.000
5	2	21.000	21.000	1.500	0.000	30.000	81.000	0.500	0.000	18.000	15.500	0.000	0.000	30.000
6	1	24.000	21.000	1.000	0.000	30.000	33.000	9.000	0.000	30.000	23.000	3.000	0.000	30.000
7	2	31.500	30.500	16.500	0.500	30.000	46.000	0.000	0.000	20.000	12.500	2.500	0.500	30.000
8	2	28.000	25.500	3.500	0.000	17.500	83.000	2.000	0.000	15.000	17.500	0.000	0.000	17.500
9	2	28.000	25.000	2.500	1.500	30.000	9.000	0.000	0.000	30.000	44.000	0.000	1.000	20.000
10	2	30.500	26.500	8.000	0.000	30.000	81.500	6.000	2.000	19.500	0.000	0.000	0.000	30.000
11	1	22.000	19.000	0.000	0.000	25.000	35.000	0.000	0.000	25.000	15.000	0.000	0.000	25.000
12	1	17.000	17.000	3.000	0.000	0.500	86.000	0.000	0.000	5.000	24.000	0.000	0.000	5.000
13	1	16.000	16.000	21.000	3.000	24.000	86.000	0.000	0.000	24.000	14.000	0.000	0.000	24.000
14	3	27.333	26.666	2.000	0.333	25.333	58.333	1.666	0.000	25.000	19.666	0.000	0.000	25.000

* See instrument for code

Classroom Observation and Recording Form:

Mean Scores for Control Schools*

SCHOOL	N	S ENROLLED	S PRESENT	POSITIVE VERBAL	POSITIVE NON-VERB.	TE-TIME	IT-1	IT-2	IT-3	TE-TIME	IO-1	IO-2	IO-3	TE-TIME
15	2	12.000	11.000	1.500	0.500	27.500	59.500	3.000	0.500	27.500	6.500	0.000	0.000	27.500
16	5	27.250	25.750	2.200	0.800	21.800	25.600	2.000	0.400	21.800	31.600	0.200	0.000	21.800
17	2	10.500	9.000	1.500	0.000	29.500	61.000	4.000	0.000	29.500	6.500	0.000	0.000	29.500
18	1	14.000	10.000	0.000	1.000	25.000	86.000	0.000	0.000	18.000	27.000	0.000	0.000	25.000
19	7	25.859	25.143	5.428	0.143	20.000	41.571	2.571	0.286	17.429	27.571	1.714	0.429	19.857
20	5	26.000	25.800	0.600	1.200	20.000	42.000	2.600	0.000	20.000	9.000	0.000	0.000	32.000
21	2	25.500	22.000	4.500	5.000	30.000	55.000	2.500	0.500	30.000	13.000	0.000	0.000	30.000
22	2	27.000	19.500	6.000	0.000	27.500	39.500	3.000	2.000	27.500	18.000	0.000	0.000	27.500
23	2	26.500	26.500	1.000	0.000	26.500	43.500	2.000	0.000	14.500	3.500	0.000	0.000	26.500
24	2	25.500	25.500	10.000	0.000	30.000	86.000	12.500	2.000	10.500	9.500	2.000	0.000	30.000
25	1	22.000	22.000	0.000	0.000	19.000	86.000	0.000	0.000	3.000	54.000	5.000	3.000	19.000
26	1	17.000	17.000	0.000	0.000	16.000	86.000	0.000	0.000	16.000	20.000	0.000	0.000	16.000
27	1	26.000	25.000	0.000	0.000	24.000	78.000	0.000	0.000	24.000	18.000	0.000	0.000	24.000
28	1	20.000	17.000	0.000	0.000	24.000	77.000	1.000	0.000	24.000	6.000	0.000	0.000	24.000
29	1	20.000	18.000	7.000	0.000	18.000	58.000	0.000	0.000	18.000	11.000	0.000	0.000	18.000
30	1	25.000	23.000	6.000	0.000	22.000	4.000	0.000	0.000	22.000	6.000	0.000	0.000	22.000
31	2	27.000	24.500	4.000	0.500	11.500	47.500	1.500	0.000	11.500	7.500	0.000	0.000	11.500

* See instrument for code

Appendix J

Raw Data for Classroom Observation and Recording Form: Recording Section

Classroom Observation and Recording Form: Mean Scores for Experimental Schools on Recording Section*

SCHOOL	N	VA#	PA#	VS#	PS#	VA min	PA min	VS min	PS min	B-1	B-2	B-3	B-4	B-5	B-6	CD-1	CD-2	CD-3	CD-4	R-1	R-2	CT-1
1	3	0.666	0.000	1.333	0.000	3.333	0.000	40.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.333	7.333	5.000
2	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	20.000	20.000	0.000
3	1	0.000	0.000	6.000	0.000	0.000	0.000	90.000	0.000	16.000	16.000	16.000	16.000	16.000	16.000	0.000	0.000	0.000	0.000	18.000	18.000	0.000
4	1	0.000	1.000	0.000	0.000	0.000	300.000	0.000	0.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	12.000	12.000	0.000
5	2	0.000	1.000	0.000	0.000	0.000	360.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000	0.000
6	1	0.000	1.000	6.000	0.000	0.000	128.000	12.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.000	6.000	0.000
7	2	0.000	0.000	1.000	0.000	0.000	0.000	17.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	35.500	35.500	0.000
8	2	0.500	0.000	2.000	0.000	12.500	0.000	55.000	0.000	12.500	0.000	12.500	12.500	0.000	12.500	12.500	0.000	0.000	0.000	7.000	7.000	0.000
9	2	0.500	0.000	6.000	0.000	47.500	0.000	20.000	0.000	2.000	0.000	0.000	0.000	0.000	0.000	2.000	0.000	0.000	0.000	7.000	5.000	0.000
10	2	5.500	0.500	0.000	0.000	90.000	90.000	0.000	0.000	12.000	0.000	12.000	0.000	0.000	12.000	12.000	0.000	0.000	0.000	8.500	8.000	0.000
11	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	22.000	0.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	6.000	6.000	12.000
12	1	0.000	1.000	4.000	0.000	0.000	180.000		0.000													
13	1	0.000	1.000	1.000	0.000	0.000	60.000	30.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.000	3.000	0.000
14	3	0.000	0.667	1.000	0.000	0.000	110.000	15.000	0.000	2.333	2.333	2.333	0.000	2.333	2.333	2.333	2.333	2.333	0.000	16.667	16.667	0.000

* See instrument for code

Experimental Schools (Continued)

SCHOOL	CT-2	CT-3	CT-4	CT-5	IP-1	IP-2	IP-3	IP-4	STN-1	STN-2	STN-3	STN-4	DRM-1	DRM-2	DRM-3	DRM-4	FS-1	FS-2	FS-3	FS-4	FS-5	IAF-1	IAF-2	IAF-3	IAF-4	IAF-5
1	5.000	5.000	5.000	5.000	0.667	0.333	0.333	0.333	5.000	5.000	5.000	5.000	0.000	0.000	0.000	0.000	2.333	2.333	2.333	2.333	2.333	5.333	5.333	5.333	5.333	5.333
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.000	4.000	4.000	4.000	4.000	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.000	16.000	16.000	16.000	16.000
4	0.000	0.000	0.000	0.000	8.000	8.000	8.000	8.000	0.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	4.000	4.000	4.000	4.000	4.000	0.000	0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	2.000	2.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.500	1.000	0.500	1.000	20.500	15.500	5.000	5.000	15.500
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.500	0.000	5.000	0.000	2.000	0.500	2.000	16.500	0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.000	2.000	0.000	0.000	0.000	0.000	0.000	0.000	2.000	0.000	2.000	0.000	2.000	15.500	0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.000	0.500	0.500	14.500	14.500	14.500	0.000	14.500
10	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	1.000	1.000	0.000	0.500	0.500	1.000	1.000	1.000	1.000	0.500	0.000	0.500	0.500	0.000	0.000	0.000	0.000	0.000
11	22.000	4.000	4.000	4.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	22.000		22.000	22.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000
12																										
13	0.000	0.000	0.000	0.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.000	5.000	5.000	0.000	5.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.333	0.333	0.000	0.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.000	2.000	2.000	2.000	2.000	5.667	0.000	5.667	5.667	0.000

Classroom Observation and Recording Form: Mean Scores for Control Schools on Recording Section *

SCHOOL	N	VA#	PA#	VS#	PS#	VA min	PA min	VS min	PS min	B-1	B-2	B-3	B-4	B-5	B-6	CD-1	CD-2	CD-3	CD-4	R-1	R-2	CT-1	CT-2
15	2	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	5	0.000	0.000	0.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	2	0.000	0.000	1.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18	1	0.000	0.000	4.000	0.000	0.000	0.000	30.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19	7	0.143	0.000	0.000	0.000	27.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.286	1.286	0.000	0.000
20	5	0.200	0.000	0.800	0.000	0.000	0.000	15.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.200	1.200	0.000	0.000
21	2	0.500	1.500	0.000	0.000	22.500	40.000	0.000	0.000	1.500	0.000	0.000	0.000	0.000	0.000	1.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000	0.000	0.000
23	2	0.000	0.000	3.500	0.000	0.000	0.000	127.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000	0.000	0.000
24	2	1.000	0.500	0.000	0.000	30.000	30.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.500	0.000	0.000
25	1	0.000	0.000	4.000	0.000	0.000	0.000	60.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	1	0.000	1.000	2.000	0.000	0.000	36.000	12.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.000	3.000	0.000	0.000
27	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28	1	0.000	0.000	1.000	0.000	0.000	0.000	60.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.000		0.000	0.000
30	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.500	1.500	0.000	0.000

* See instrument for code

146

147

Control Schools (Continued)

SCHOOL	CT-3	CT-4	CT-5	IP-1	IP-2	IP-3	IP-4	STM-1	STM-2	STM-3	STM-4	DRM-1	DRM-2	DRM-3	DRM-4	FS-1	FS-2	FS-3	FS-4	FS-5	IAF-1	IAF-2	IAF-3	IAF-4	IAF-5
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.200	0.200	0.200	0.200	0.000	0.000	0.000	0.000	0.200	0.000	0.000	0.000	1.400	1.400	1.400	1.200	1.200	0.000	0.000	0.000	0.000	0.000
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.200	0.200	0.200	0.000	0.000	0.000	0.000	0.200	0.000	0.200	0.200	0.200	0.000	0.000	0.000	0.000	0.000
21	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.500	0.500	0.000	0.500	0.000	0.000	0.000	0.000	4.000	3.500	4.000	0.500	4.000	13.500	13.500	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.000	0.000	4.000	0.500	4.000	20.000	1.500	19.000	0.000	0.000
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Appendix K

Raw Data for Teacher Inventory

First Administration

Teacher Inventory: Mean Raw Scores for Experimental Schools Upon Completion of "Teaching Exceptional Children in the Regular Classroom"

School	N	Job Satisfaction Employment	Students	Administrators	Faculty	Equipment and Supplies	Textbooks	Grade level	Job Effectiveness Reading	Arithmetic	Spelling	Language arts	Social Studies	Health	Science	Music	Art	Physical Education	Other
1	3	3.333	2.667	5.667	5.000	4.000	5.000	5.667	3.333	4.000	3.000	3.667	3.000	3.000	3.000	2.000	3.333	3.333	
2	1	5.000	3.000	5.000		4.000	5.000		4.000	4.000	2.000	3.000	4.000	2.000	2.000	3.000	3.000	2.000	
3	1	5.000	5.000	6.000	5.000	5.000	6.000	6.000	4.000	4.000	4.000	4.000	4.000	4.000	3.000	3.000	3.000	4.000	
4	1	5.000	4.000	5.000	6.000	5.000	5.000	3.000	3.000	4.000	4.000	3.000	2.000	3.000	2.000	1.000	2.000	4.000	
5	3	4.333	2.667	4.667	5.333	4.333	4.667	6.000	3.000	4.000	3.000	3.500	3.500	3.500	4.000	4.000	2.500	3.500	
6	2	4.500	2.500	5.500	5.500	3.500	5.000	5.000	3.500	4.000	4.000	3.000	2.500	4.000	4.000	3.500	3.500	3.500	5.000
7	2	4.500	4.500	5.500	4.000	2.500	4.500	5.000	3.500	2.500	2.000	3.500	3.000	4.500	4.000	2.500	4.000	3.000	
8	5	4.800	3.800	5.200	5.200	3.400	4.200	5.000	3.200	3.000	3.250	3.200	3.000	2.750	2.600	1.750	3.000	3.400	
9	4	5.000	4.250	5.000	5.250	3.000	5.333	5.333	4.250	4.250	3.000	3.333	3.667	3.000	3.333	3.250	1.500	2.667	
10	2	5.000	4.000	6.000	6.000	4.000	5.000	6.000	4.000	3.500	4.000	4.000	3.000	4.500	3.500	3.400	4.000	3.500	
11	2	4.500	4.500	5.500	5.500	4.500	5.500	5.500	4.500	5.000	4.500	4.500	5.000	4.500	4.500	3.000	5.000	3.000	
12	2	5.000	3.500	6.000	4.500	3.500	4.500	6.000	3.500	4.000	3.000	4.000	3.000	4.000	3.000	4.000	3.500	3.000	
13	1	5.000	4.000	6.000	6.000	5.000	5.500	6.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	2.000	3.000	2.000	
14	6	4.333	3.667	5.667	5.167	4.500	5,000	5.500	4.500	4.167	3.667	3.667	3.333	3.167	3.333	2.250	3.000	3.250	

School	Percentage of Students Taught Effectively Reading	Arithmetic	Spelling	Language arts	Social Studies	Health	Science	Music	Art	Physical Education	Other
1	60.000	80.000	75.000	76.667	62.500	65.000	60.000	45.000	90.000		
2		100.000	80.000	70.000	90.000	70.000	70.000	90.000	80.000		
3	100.000	100.000	100.000	75.000	75.000	100.000	75.000	50.000	75.000	100.000	100.000
4	60.000	75.000	90.000	60.000	50.000	75.000	75.000	100.000	100.000	100.000	
5	90.000	92.500	75.000	85.000	80.000	75.000	80.000	92.500	82.500	85.000	
6	92.500	92.500	95.000	85.000	82.500	95.000	85.000	87.500	87.500	92.500	100.000
7	82.500	85.000	80.000	95.000	97.500	100.000	95.000	90.000	97.500	90.000	
8	86.000	91.000	87.500	79.000	80.000	70.000	66.667	90.000	92.000	91.000	70.000
9	88.750	87.500	80.000	86.667	83.333	82.500	85.000	86.250	90.000	83.333	
10	97.500	97.500	95.000	100.000	90.000	87.500	87.500	95.000	97.500	100.000	
11	100.000	100.000	100.000	100.000	100.000	100.000	100.000		100.000		
12	87.500	82.500	85.000	80.000	72.500	77.500	70.000	92.500	85.000	75.000	
13	100.000	100.000	100.000	100.000	100.000	100.000	100.000				
14	96.667	94.167	88.333	87.500	84.000	78.750	93.333				

Teacher Inventory: Mean Raw Scores for Control Schools Upon Completion of "Teaching Exceptional Children in the Regular Classroom"

		Job Satisfaction							Teaching Effectiveness											Percentage of Students Taught Effectively										
School	N	Employment	Students	Administrators	Faculty	Equipment and Supplies	Textbooks	Grade level	Reading	Arithmetic	Spelling	Language Arts	Social Studies	Health	Science	Music	Art	Physical Education	Other	Reading	Arithmetic	Spelling	Language Arts	Social Studies	Health	Science	Music	Art	Physical Education	Other
15	2	4.000	4.000	5.500	5.500	2.500	3.000	6.000	3.000	3.500	2.500	2.000	1.000	2.000	3.000	1.000	3.000	1.000		85.000	85.000	65.000	50.000	25.000	50.000	50.000	2.000	75.000	2.000	
16	5	4.600	3.600	3.600	4.400	3.800	4.400	5.600	3.600	4.000	3.500	3.600	3.200	2.600	3.200	2.750	2.750	3.200		81.000	86.000	77.500	81.000	72.000	55.200	66.000	53.333	75.000	76.000	
17	2	5.000	3.500	6.000	6.000	4.500	5.000	5.500	3.500	3.500	2.500	3.000	3.000	3.000	3.000	1.500	3.500	1.000		87.500	90.000	77.500	82.500	87.500	87.500	80.000	60.000	90.000	80.000	
18	1	4.000	5.000	6.000	6.000	4.000	4.000	4.000	5.000	3.000	4.000	4.000	3.000	2.000	2.000	1.000	3.000	1.000		95.000	70.000	90.000	90.000	75.000	60.000	55.000	25.000	60.000	25.000	
19	8	4.625	3.625	5.625	4.750	3.500	4.500	5.000	3.750	3.750	3.875	3.875	3.375	3.000	3.250	2.125	3.375	3.375		89.286	85.625	85.625	84.375	77.500	80.625	75.000	38.333	75.000	84.375	
20	5	4.200	3.600	4.600	3.800	2.200	3.600	5.400	3.600	3.800	3.600	3.400	3.600	3.000	3.250	1.250	2.250	2.750	5.000	83.000	89.800	80.250	83.250	87.750	72.000	87.000	5.500	52.900	25.000	
21	5	3.400	3.800	3.200	4.000	2.800	4.800	5.500	4.250	4.000	3.500	3.750	2.000	2.500	3.500	3.250	2.500	2.250	3.667	81.750	83.750	70.000	80.000	53.750	63.750	76.250	67.500	67.500	47.500	97.000
22	12	4.167	3.750	4.417	4.500	2.750	3.500	5.333	2.833	3.455	2.909	3.000	2.727	3.091	2.909	2.455	2.727	3.636	2.000	65.455	80.500	70.000	64.000	60.000	71.500	64.000	62.111	81.400	90.900	93.000
23	3	4.333	3.667	5.000	5.000	4.000	4.667	4.667	3.000	4.333	3.333	3.333	3.333	3.667	4.000	3.333	3.333	4.500	3.000	57.500	80.000	71.667	55.000	73.333	75.000	75.000	62.500	80.000	85.000	20.000
24	4	4.500	4.000	3.750	4.750	2.500	4.750	5.250	3.750	3.500	3.500	3.250	2.750	2.750	2.500	2.750	2.750	2.750		86.250	87.500	90.000	80.000	78.333	80.000	76.667	70.000	76.667	73.333	
25	1	5.000	5.000	6.000	6.000	3.000	3.000	5.000	4.000	4.000	3.000	4.000	2.000	4.000	3.000	3.000	3.000	2.000		85.000	95.000	60.000	75.000	75.000	50.000	50.000	65.000	75.000	50.000	
26	1	5.000	5.000	5.000	5.000	3.000	4.000	5.000	3.000	4.000	3.000	4.000	4.000	3.000	5.000	3.000	3.000	3.000		70.000	90.000	90.000	70.000	70.000						
27	1	5.000	5.000	6.000	6.000	4.000	6.000	4.000	3.000	4.000	3.000	3.000	4.000	3.000	4.000	3.000	4.000	4.000		85.000	80.000	80.000	85.000	85.000	85.000	85.000	85.000	85.000	90.000	
28	1	5.000	5.000	5.000	4.000	3.000	3.000	4.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	5.000	4.000		100.000	100.000	100.000	100.000	100.000	100.000	100.000	0.000	100.000	0.000	
29	1	5.000	5.000	6.000	6.000	3.000	6.000	6.000	3.000	5.000	4.000	4.000	2.000		3.000					80.000	95.000	99.000	75.000	75.000		100.000				
30	5	4.800	4.800	4.400	5.400	2.400	4.000	5.800	3.800	4.000	3.400	3.800	3.800	3.000	3.200	3.200	3.200	3.400		89.250	84.800	73.500	87.600	86.200	78.000	83.600	79.750	93.750	71.667	
31	3	4.333	4.667	4.667	4.333	3.667	4.333	5.000	3.667	3.667	3.667	3.667	4.333	2.667	3.667	4.000	3.000	3.500	5.000	92.667	86.667	86.667	83.333	86.667	100.000	87.500	100.000	62.500	87.500	100.000

Appendix L

Raw Data for Teacher Inventory: Second Administration

Teacher Inventory: Mean Scores for Experimental Schools Upon Completion of "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

		Job Satisfaction							Teaching Effectiveness											Percentage of Students Taught Effectively										
School	N	Employment	Students	Administrators	Faculty	Equipment & supplies	Textbooks	Grade level	Reading	Arithmetic	Spelling	Language Arts	Social Studies	Health	Science	Music	Art	Physical Education	Other	Reading	Arithmetic	Spelling	Language Arts	Social Studies	Health	Science	Music	Art	Physical Education	Other
1	3	4.333	3.667	6.000	5.333	4.000	5.333	5.333	3.667	4.667	3.333	3.333	3.000	2.667	2.333	2.333	4.000	3.667		[illegible]7.500	85.000	80.000	80.[illegible]00	85.000	85.000	85.000	85.000	90.000	85.000	
3	1	5.000	4.000	6.000	5.000	5.000	6.000	6.000	4.000	4.000	4.000	4.000	4.000	6.000	2.000	3.000	3.000	4.000		90.000	90.000	90.000	90.000	90.000	90.000	75.000	50.000	75.000	100.000	
5	2	5.000	4.000	5.500	5.000	4.000	3.500	6.000	3.500	4.000	4.000	3.500	2.500	[illegible].500	2.500	2.000	3.333	3.000		82.500	80.000	100.000	80.000	80.000	80.000	80.000	80.000	80.000	80.000	
6	1	5.000	4.000	5.000	6.000	4.000	4.000	5.000	3.000	3.000	4.000	3.000	3.000	3.000	3.000	2.000	2.000	3.000		95.000	75.000	95.000	80.000	75.000	75.000	75.000	60.000	60.000	75.000	
7	1	5.000	5.000	6.000	6.000	4.000	5.000	6.000	3.000	3.000	3.000	3.000	4.000	5.000	3.000	1.000	5.000	4.000		85.000	98.000	98.000	80.000	85.000	100.000	90.000	90.000	100.000	100.000	
8	2	5.000	3.500	6.000	5.000	4.000	5.000	5.500	3.000	3.500	3.000	3.500	2.500	1.000	2.000	1.000	2.000	2.500		85.000	88.500	92.500	82.500	90.000	90.000	70.000	97.500	82.500	92.500	
9	3	5.000	4.667	5.667	5.333	3.667	5.333	6.000	3.333	4.000	3.333	3.667	3.333	3.333	3.333	4.000	3.667	2.500	4.000	85.000	91.667	88.333	88.333	82.500	78.333	78.333	0.000	80.333	80.000	90.000
12	2	4.500	3.500	5.500	4.500	2.000	4.000	6.000	4.000	4.000	3.500	4.000	3.000	3.000	3.000	4.500	3.500	3.500		80.000	85.000	90.000	70.000	65.000	65.000	85.000	80.000	80.000	75.000	
13	1	5.000	4.000	6.000	6.000	5.000	6.000	6.000	4.000	4.000	4.000	4.000								100.000	100.000	95.000	95.000							

Teacher Inventory: Mean Scores for Control Schools Upon Completion of "Instructional Materials: How to Analyze, Adapt, Select, and Develop"

		Job Satisfaction							Teaching Effectiveness											Percentage of Students Taught Effectively										
School	N	Employment	Students	Admini-strators	Faculty	Equipment & Supplies	Textbooks	Grade level	Reading	Arithmetic	Spelling	Language Arts	Social Studies	Health	Science	Music	Art	Physical Education	Other	Reading	Arithmetic	Spelling	Language Arts	Social Studies	Health	Science	Music	Art	Physical Education	Other
15	1	4.000	5.000	6.000	5.000	3.000	4.000	6.000	2.000	3.000	2.000	2.000	2.000	2.000	3.000	1.000	3.000	1.000		50.000	50.000	60.000	50.000	50.000	50.000	50.000	0.000	0.000	0.000	
16	5	4.800	4.000	4.200	4.200	4.000	4.200	5.600	4.000	4.600	3.750	4.250	3.500	3.333	3.600	3.667	4.000	3.200		82.000	88.000	77.500	81.250	76.250	75.000	74.000	80.000	93.333	83.333	
17	2	5.000	4.000	5.500	6.000	4.000	5.500	5.500	3.500	3.500	3.000	3.500	3.000	2.500	3.500	2.000	3.500	2.000		90.000	90.000	90.000	90.000	87.500	87.500	87.500	80.000	87.500	80.000	
18	1	3.000	5.000	5.000	6.000	4.000	4.000	2.000	4.000	3.000	3.000	2.000	4.000	1.000	1.000	1.000	2.000	2.000		90.000	80.000	80.000	65.000	90.000	35.000	50.000	10.000	15.000	40.000	
19	8	4.375	3.375	5.625	5.625	3.875	4.750	5.286	4.000	4.125	3.875	4.000	3.250	3.250	3.000	2.000	3.000	3.250		91.875	93.500	91.143	84.375	78.125	81.875	72.857	63.667	78.000	80.000	
20	4	3.750	3.500	3.750	3.500	2.250	4.500	5.000	4.000	4.000	3.750	3.250	2.750	3.000	2.75	2.667	2.000	2.667		92.250	87.500	85.000	87.500	81.667	83.333	83.333	90.000	90.000	95.000	
21	1	5.000	4.000	3.000	4.000	3.000	6.000	6.000	4.000	3.000	4.000	3.000	4.000	4.000	4.000	5.000	4.000	2.000		85.000	75.000	75.000	75.000	90.000	90.000	75.000	100.000	95.000	95.000	
22	11	4.182	3.909	4.727	4.545	2.700	3.700	5.100	3.273	3.818	3.700	3.091	3.091	3.000	3.000	2.636	3.091	3.818		75.300	84.200	75.900	73.500	78.000	71.400	72.111	72.667	81.444	91.333	
23	2	4.500	3.500	4.500	5.500	4.500	4.500	4.500	3.500	4.500	4.000	3.000	4.000	4.000	4.500	3.000	3.000	4.500	4.000		77.500	75.000		65.000	72.500	72.500	90.000	65.000	92.500	80.000
24	1	3.000	3.000	4.000	4.000	3.000	3.000	5.000	4.000	4.000	2.000	3.000	3.000	3.000	4.000	3.000	3.000	3.000		90.000	90.000									
25	1	5.000	5.000	6.000	6.000	3.000	5.000	6.000	4.000	4.000	3.000	4.000	2.000	2.000	2.000	2.000	3.000	2.000		90.000	90.000	85.000	80.000	75.000	75.000	75.000	50.000	75.000	50.000	
27	1	5.000	5.000	6.000	6.000	5.000	6.000	6.000	4.000	5.000	4.000	4.000	5.000	4.000	5.000	4.000	5.000	5.000		98.000	98.000	85.000	85.000	90.000	85.000	95.000	95.000	95.000	95.000	
28	1	5.000	4.000	3.000	5.000	3.000	5.000	5.000	4.000	4.000	3.000	3.000	3.000	3.000	2.000	2.000	4.000	3.000		90.000	90.000	80.000	80.000	85.000	85.000	50.000	10.000	95.000	50.000	
30	5	4.800	5.000	4.000	5.400	2.600	4.200	5.800	3.600	3.800	3.800	4.000	4.000	3.300	3.200	3.200	3.400	3.000		64.600	71.800	70.800	72.800	73.600	70.400	68.400	98.333	81.000	93.333	
31	3	4.333	4.667	5.000	4.333	3.667	4.667	5.333	3.667	4.000	4.000	3.667	4.000	3.333	1.333	4.500	4.000	3.500	4.500	85.000	86.667	85.000	81.667	88.333	80.000	71.667	90.000	82.500	77.500	100.000

Appendix M

Questionnaire

UTAH STATE UNIVERSITY · LOGAN, UTAH 84322

COLLEGE OF EDUCATION

DEPARTMENT OF
SPECIAL EDUCATION

May 17, 1976

The staff of the Inservice Teacher Training Project is concerned with the reasons people did not complete either "Teaching Exceptional Children in the Regular Classroom" or "Instructional Materials: How to Analyze, Adapt, Select, and Develop." Please indicate why you decided not to continue in the course, by checking the one statement which best fits your reason(s).

_____ The material was too difficult.

_____ There was a lack of personal contact with project staff.

_____ It took too much time to do the required work.

_____ Required teaching activities conflicted with the course work.

_____ Help was not readily available when problems arose.

_____ Personal reasons interfered with completion of the course.

_____ The approach taken in the course disagress with my philsophical stance.

_____ Other (specify) ____

Please return this questionnaire in the enclosed envelope. Thank you for your assistance with our project.

Sincerely,

Hyrum S. Henderson
Project Director

UTAH STATE UNIVERSITY · LOGAN, UTAH 84322

COLLEGE OF EDUCATION

DEPARTMENT OF
SPECIAL EDUCATION

May 17, 1976

Compilation of Data

The staff of the Inservice Teacher Training Project is concerned with the reasons people did not complete either "Teaching Exceptional Children in the Regular Classroom" or "Instructional Materials: How to Analyze, Adapt, Select, and Develop." Please indicate why you decided not to continue in the course, by checking the one statement which best fits your reason(s).

_2_ The material was too difficult.

_10_ There was a lack of personal contact with project staff.

_13_ It took too much time to do the required work.

_5_ Required teaching activities conflicted with the course work.

_8_ Help was not readily available when problems arose.

_4_ Personal reasons interfered with completion of the course.

_1_ The approach taken in the course disagress with my philsophical stance.

_6_ Other (specify) ____________________

Please return this questionnaire in the enclosed envelope. Thank you for your assistance with our project.

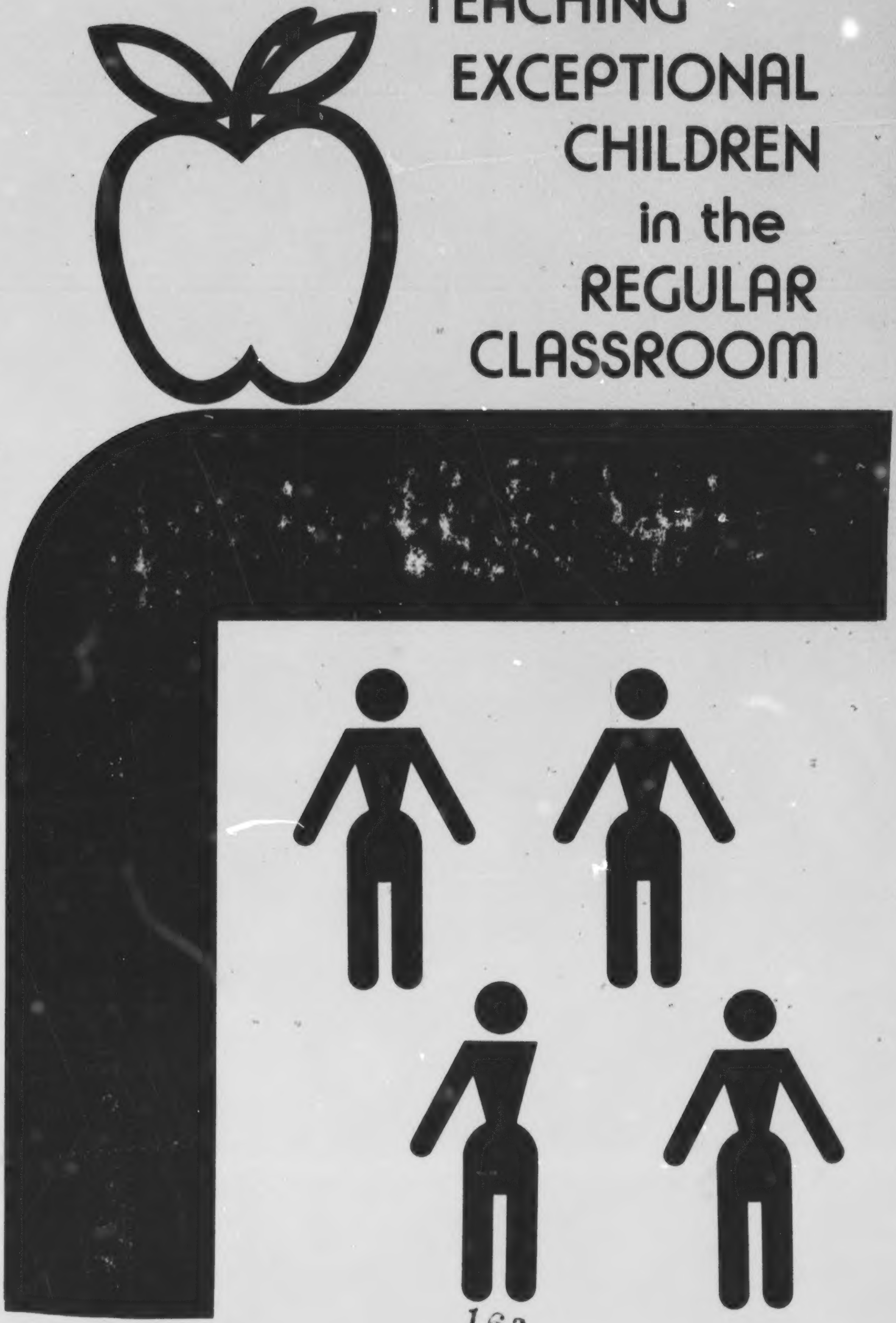
Sincerely,

Hyrum S. Henderson
Project Director

Comments:

text difficult to understand
assignments not useable in classroom
management of record keeping materials unclear

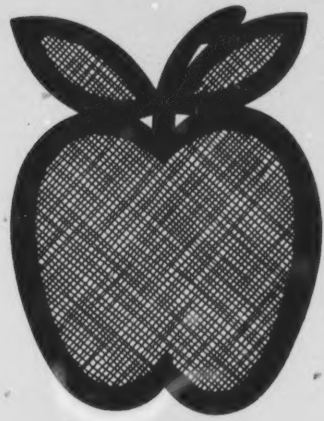
TEACHING EXCEPTIONAL CHILDREN in the REGULAR CLASSROOM



UTAH STATE UNIVERSITY
LOGAN, UTAH 84322

TEACHING EXCEPTIONAL CHILDREN IN THE REGULAR CLASSROOM

Instructional Material for Special Education 539
UTAH STATE UNIVERSITY
Logan, Utah 84322



**This material was prepared under
BEH Contract OEC-0-74-9327
Hyrum S. Henderson
Principal Investigator**

**Contributors to the product were
Hyrum S. Henderson
Dennis L. Burns
Julie Landeen
Jeanne Stevenson Christiansen**

Copyright © 1976

Utah State University Press

Contents

Part I. Behavior Measurement and Change

INTRODUCTION 6

BEHAVIOR 7
  Objective 7
  Rationale 7
  Observable 7
    Direct Observation 7
    Indirect Observation 7
    Summary 7
  Verifiable 7
  Measurable 8
    Accuracy 8
    Rate of Response 8
  The Language of Behavior 8
  Summary 8

MEASUREMENT 11
  Objective 11
  Rationale 11
  Types of Measurement 11
    Accuracy 11
    Time and/or Rate of Response 11
    Examples 11
    Practice Exercise 11
    Summary 16
  Measures to Use 16
    Other Measures 19

CHANGING BEHAVIOR 21
  Objective 21
  Rationale 21
  Changing Behavior 21
  Baseline 21
  Reinforcement 22
    Token Reinforcement System 25
    Reinforcing Events 25
    Graphing Program Changes 26
    Choosing Reinforcers 28
  Potential Reinforcer List 28
    Playthings 28
    Physical Contact or Proximity–Approval . 28
    Words and Symbols, Written–Approval . . 28
    Expressions of Approval–Facial 28
    Activities and Privileges–Individual
      Approval 29
    Social 29
    Things, Approval–Access to, Turns,
      Use of Things Coupled with
      Approval 29
    Food 29
    Reinforcers Which Are Available
      in Almost Any Classroom 29
    Home Reinforcers 29
  Making the System Work 32
    Be Consistent 32
    Be Positive 32
    Vary Your Reinforcers 32
  Appropriate Verbal Behavior 33
  Teacher Attention 33
  Planned Ignoring 33
  Decreasing Behavior 34
    Reinforcement of Incompatible Behavior . 34
    Extinction 34
    Punishment 34
    Summary of Ways to Decrease Behavior . . 35
  Including the Whole Class 35

REFERENCES 36

Part II. Instructional Planning and Individualization

INSTRUCTIONAL PLANNING 38
  Introduction of Instructional Planning 38
    Purpose of the Unit 38
    Definition of Individualized Instruction . . . 38
    Definition of an Instructional Plan 38
    Uses for Instructional Plans 38
  Steps for Writing an Instructional Plan 38
    Step 1 38
    Step 2 38
    Step 3 39
    Examples 39
    Step 4 40
    Step 5 41
    Example 42
    Step 6 42
    Example 43
  Establishing Minimum Performances 44
    Accuracy 44

        Rate of Response 44
    Criterion Referenced Testing 49
        Motor and Oral Responses 49
        Written Responses 50
    A Filing System 53
    Summary 54

CLASSROOM MANAGEMENT TECHNIQUES FOR INDIVIDUALIZING INSTRUCTION 56
    Introduction 56
    Rationale 56
    Classroom Arrangement 56
    Daily Assignment Folders 57
    Daily Routine Chart 60
    Tutors 61
        Selection of Tutors 61
        Prerequisites for Tutoring 61
        Skills 61
        Training Tutors 61
        Monitoring Tutors 62
    Student Management 62

SAMPLE CONTENTS OF DAILY ASSIGNMENT FOLDER 65

ASSIGNMENT SHEETS 71

Practice Exercises

Practice Exercise 1 8
Practice Exercise 2 9
Answer Key to Practice Exercise 2 10
Practice Exercise 3 14
Answer Key to Practice Exercise 3 15
Practice Exercise 4 17
Answer Key to Practice Exercise 4 18
Practice Exercise 5 40
Answer Key to Practice Exercise 5 40
Practice Exercise 6 41
Answer Key to Practice Exercise 6 41
Practice Exercise 7 43
Answer Key to Practice Exercise 7 43
Practice Exercise 8 44
Answer Key to Practice Exercise 8 44
Practice Exercise 9 49
Practice Exercise 10 50
Practice Exercise 11 52
Practice Exercise 12 52

Assignments

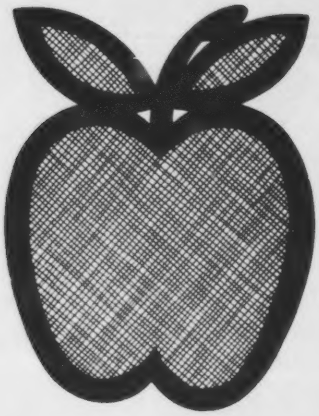
Assignment 1 9
Assignment 2 24
Assignment 3 30
Assignment 4 32
Assignment 5 34
Assignment 6 39
Assignment 7 42
Assignment 8 43
Assignment 9 45
Assignment 10 53
Assignment 11 53
Assignment 12 60
Assignment 13 61
Assignment 14 63

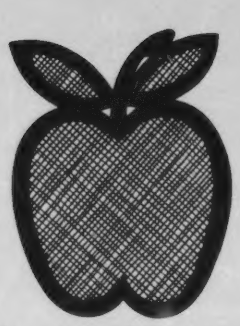
Charts and Sample Pages

Determining Rate and Accuracy 16
Measurement Chart 20
Initial Program to Increase Behavior: Learning 23
Potential Reinforcer List 28
Checklist for Beginning a Reinforcement Program . . . 31
Establishing Minimum Performances 44
Instructional Planning Sheets 46-48
Sample Multiplication Test 51
Instructional-assessment Model 55
Classroom Arrangement Diagrams 56, 58
Sample Daily Assignment Sheet 59
Daily Assignment Sheet Form 67
Sample Multiplication Test 68
Sample Multiplication Test (Answer Key) 69
Assignment Cover Sheets 73-83

Part I.

Behavior Measurement and Change





Introduction

Provision of appropriate education for all handicapped children is now a matter of law and not choice in much of the United States. Yet the establishment of legal requirements and the actual delivery of appropriate educational services are two different matters. While many states have enacted legislation guaranteeing education to all handicapped children in the state, none has been able to make this a reality, as yet, although progress is being made.

As special education for the handicapped developed, the most common provision for education was the self-contained special education class segregated from the mainstream of education. In many cases, the classes were physically separated, having separate facilities, teachers, and administrators. Special education became a mini school system within a school system in many districts.

As special classes proliferated, problems arose. It became painfully obvious, particularly in the larger urban areas, that special education classes enrolled disproportionate numbers of children from racial and ethnic minorities to the point that segregation for "special" education became *de facto* racial segregation or, at least, segregation by social class. This was particularly true in classes designated as "educable mentally retarded" where the only observable difference in the students enrolled and those in regular classes was academic performance and/or behavior problems.

Questions as to the effectiveness of special classes resulted in many efficacy studies being done, most of which showed that at best the special classes were no more effective than the regular classes as far as academic achievement is concerned, despite smaller class size, specially trained teachers, and higher per pupil expenditure of funds (Hammons, 1972).

Many children and parents perceived placement in special education programs as discrimination and the stigma of such placement became a source of friction between parents and their children on the one hand and the school personnel on the other.

These serious questions concerning the rights of handicapped children and the appropriateness of the education provided for them, have led to an increasing return of handicapped children to the regular classrooms. The term "mainstreaming" has been used to describe the increasing emphasis on providing the handicapped child with appropriate education without segregation to as great an extent as possible. This trend received great impetus from Dunn's landmark article on the appropriateness of special class placement (Dunn, 1969).

The concern for the right to appropriate education for handicapped children has also increased as a result of court decisions which have ruled that the schools may not deny education to children due to handicapping conditions (PARC vs. Pennsylvania). Federal legislation has also required school districts to provide appropriate education and to guarantee parental input, frequent review of the child's educational program, guarantees of procedural due process, and a service system that is the "least restrictive" alternative suitable to the needs and capabilities of the child (PL 93-380). Recent federal legislation reaffirms and extends such guarantees and strengthens the due process provisions of the law. Another provision of the new legislation is concerned with retraining all teachers providing education to the handicapped.

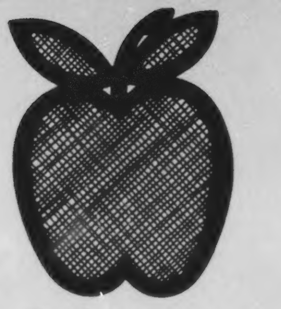
The least restrictive option for the delivery of special educational services to the handicapped, in most cases, is the regular classroom augmented by the resource room where the handicapped pupil can receive special intensified instruction in critical skills. *Widespread adoption of this service model is shifting the responsibility for the education of the handicapped from special education personnel back to regular classroom teachers and local building principals.*

Probably the most important variable affecting the quality of education the handicapped (or any other) child receives is the skill and competence of the teacher who instructs the child and manages his or her educational program. This means that if the handicapped child is to receive quality education in the regular classroom, the teacher will need training in providing an appropriate individualized program so that the needs of the handicapped are not sacrificed to the needs of the rest of the students.

The assumption on which this course is designed is that the way in which the regular classroom teacher can best meet the needs of handicapped children in her or his class is through individualized instruction in the basic skills areas, particularly reading and arithmetic.

In order to manage an individualized instruction program and insure progress for all students, the teacher will have to have skills in management of student behavior and the instructional program.

The course consists of two parts, the first dealing with behavior and how it can be measured and changed, and the second dealing with instructional planning for individualization.



Behavior

OBJECTIVE

1. To state expected outcomes of teaching in terms of student behavior.

RATIONALE

The major objective of education is that the students learn. The function of the teacher is to arrange the conditions of the environment which affect learning in such a way that the students learn the things the teacher intends to teach. If the teacher is to be effective in promoting student learning, the teacher must be able to determine the effect of what he or she does (e.g. instruction) on this learning.

To the extent that learning is perceived as a mental process, it is not observable and the teacher can have no direct knowledge of it; therefore, learning must be inferred from what the learner does. *What the learner does is behavior; thus, behavior becomes the source of feedback to the teacher regarding the learning of the student.* Many definitions have been offered of learning. The most useful and probably the most widely accepted is: *Learning is a change in behavior as a result of experience. If this definition is accepted, the goal of teaching is changing behavior.*

Since the goal of teaching is changing behavior, it is important that we identify and correctly specify what behavior is and is not. We work toward changing those behaviors which are called for by our objectives but are lacking in our students. The following is an operational definition of behavior: *Behavior is anything that a living thing does which is observable, verifiable, and measurable.* Any human activity or function which meets these criteria is behavior and, conversely, any human activity or function which does not meet these criteria is not behavior. Let us examine each of these criteria individually.

OBSERVABLE

Direct Observation

To be observable an activity must be such that it is experienced or witnessed through the senses. The senses most used in observing behavior are sight and hearing. Occasionally educational activities which can be smelled, tasted, or touched are observed; however, private events such as emotional feelings or personality traits are *not* observable.

Indirect Observation

Behavior can be indirectly observed through measurement of a permanent product. For some behaviors a product remains as a result of the behavior. Observation of the product is as good as direct observation of the behavior if you can be certain that the product is, in fact, a result of the behavior. For example, if you give a student a page of arithmetic problems to write the answers to and a short while later he or she returns the page with the answers written on the page, you can be sure that someone did engage in the behavior of writing the answers even though you did not observe the child doing it. You would, however, need to be certain (a) that it was the same page, (b) that the same student did the writing, and (c) that he or she did not copy or otherwise obtain the answers from another student.

Summary

Any activity of a living thing which you can see or hear or physically feel is behavior. We can also accept products of behavior as evidence of behavior. Any activity that is observable in any of these ways is behavior.

VERIFIABLE

If a behavior exists and is directly observable by one individual it must also be observable by others. In describing or identifying a behavior, use words or terms that leave no doubt or necessity for interpretation on the part of any person who may have an interest in it. Accurate description also makes it possible to decide with high reliability whether or not any given behavior is an instance of the stated behavior. For example, you may be interested in the behavior of oral reading. You can hear the child read orally, and other observers can verify that he or she is reading orally. The behavior is both observable and verifiable. On the contrary, if the behavior had been stated as silent reading it would not be observable or verifiable. The child may appear to be reading or may just be looking at the page. It cannot be verified by direct observation whether he or she is in fact reading or not.

MEASURABLE

If a stated behavior is observable and verifiable, it is also measurable. Measurable means that it can be objectively quantified or counted. The two most commonly used measures of the academic behaviors of school children are (1) accuracy and (2) rate of response or frequency.

Accuracy

If the ratio of correct responses to total responses can be determined, the accuracy of the behavior is measurable. Accuracy is usually expressed as a percentage. It is obtained by dividing the number of correct responses by the total number of responses and multiplying by 100.

Rate of Response

The number of occurrences of behavior (responses) in relation to the time in which the behaviors occur is the rate of response.

$$\text{Rate} = \frac{\text{number of correct responses}}{\text{elapsed time}}$$

Rate is usually expressed in responses per minute. If the elapsed time is in even minutes, simply divide the number of correct responses by the number of minutes to get the rate. If the time is in seconds, divide the number of correct responses by the number of seconds and multiply by 60 to get the rate in correct responses per minute.

THE LANGUAGE OF BEHAVIOR

The use of appropriate language can help in stating behaviors clearly and understandably. The most important word in a statement of behavior is the verb. The verb must describe the action that is the purpose of the statement: it must be an *action verb.* The action described must meet the three criteria, that is, it must be observable, verifiable, and measurable.

Look at the verbs listed below. Note the verbs listed as action verbs and contrast them with those listed as nonaction verbs. Note mentally whether each verb meets the three criteria.

Use action verbs such as:

walks
runs
writes
talks (says) (speaks)
draws
lifts
carries

Don't use nonaction verbs such as:

thinks
listens
wonders
appreciates
daydreams
identifies
understands
recognizes
resents
perceives

Note that all the verbs in the "action verbs" column are observable, verifiable, and measurable. Note that the verbs in the "nonaction verbs" column are not observable, verifiable, and measurable.

SUMMARY

It is important to analyze what we want children to learn in terms of the behavior they will exhibit when they demonstrate that they have learned it. This enables us to evaluate the learning more objectively and with less guess work.

When we identify the behaviors we are interested in, we should look at each behavior and ask if it is: (1) observable, (2) verifiable, and (3) measurable. If we can answer yes to each of these, it is a properly stated behavior.

Practice Exercise 1

In the following chart, add five common verbs that describe behaviors of school children, then check yes or no on each criterion for each behavior.

Verb	Observable		Verifiable		Measurable	
	Yes	No	Yes	No	Yes	No
Write	X		X		X	

Practice Exercise 2

Directions

On the chart below check each verb listed as "yes" or "no" for meeting each of the three criteria and indicate if each is a behavior or not. Check this assignment yourself. Do not send it in.

Verbs	Observable		Verifiable		Measurable		Behavior	
	Yes	No	Yes	No	Yes	No	Yes	No
Walking								
Thinking								
Reading (oral)								
Reading (silent)								
Writing								
Enjoying								
Fighting								
Talking								
Organizing								
Appreciating								
Pounding								
Hopping								
Defying								
Jumping								

Criteria

Fourteen out of 15 correct answers within each of the following categories: (a) observable, (b) verifiable, (c) measurable, and (d) behavior.

Assignment 1

Directions

Pick three behaviors which you consider important in reading and/or arithmetic (or whatever subject you teach if not reading or arithmetic). Choose the behavior that most of your students will need to improve. State the behavior so that it meets the criteria of being observable, verifiable, and measurable. Be sure there is an action verb in your statement of the behavior.

Examples of reading and arithmetic behaviors

Reading

saying (orally reading) sounds of letters
saying (orally reading) words from a list
saying (orally reading) words in sentences
writing answers to questions from reading
etc.

Arithmetic

oral counting by rote
oral counting of objects
writing answers to addition facts
writing answers to subtraction facts
etc.

Criteria

Each of the three stated behaviors must: (1) be a necessary behavior in mastering the skill, (2) be observable, (3) be verifiable, and (4) be measurable.

Answer Key to Practice Exercise 2

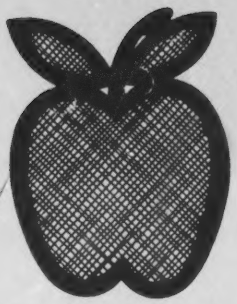
Verbs	Observable		Verifiable		Measurable		Behavior	
	Yes	No	Yes	No	Yes	No	Yes	No
Walking	✓		✓		✓		✓	
Thinking		✓		✓		✓		✓
Reading (oral)	✓		✓		✓		✓	
Reading (silent)		✓		✓		✓		✓
Writing	✓		✓		✓		✓	
Enjoying		✓		✓		✓		✓
Fighting	✓		✓		✓		✓	
Talking	✓		✓		✓		✓	
Organizing		✓		✓		✓		✓
Appreciating		✓		✓		✓		✓
Pounding	✓		✓		✓		✓	
Hopping	✓		✓		✓		✓	
Defying		✓		✓		✓		✓
Jumping	✓		✓		✓		✓	

Explanation of Answers

Those verbs that describe motor responses are fairly straightforward and require little interpretation. Some of the verbs describe processes which must be inferred from other observable actions. For example:

THINKING. We must infer that thinking is occurring because we know that human beings are always thinking, at least when they are awake, or the person may appear to be concentrating, or scratching his or her head, or some other behavior usually associated with thinking. We can observe these behaviors and infer (and perhaps correctly so) that thinking is occurring but we cannot directly observe the thinking, much less verify or measure it.

ENJOYING. We may observe a person smiling, or laughing, or talking and expressing enjoyment, and from these actions we may infer (and again, perhaps correctly so) that the person is enjoying something, but we cannot observe the "enjoying" itself since it is a feeling within the individual. Smiling or laughing may be indications of "enjoyment" but they are not the "enjoyment" itself.



Measurement

OBJECTIVE

2. Select and use the methods of measurement which provide the most useful information for making teaching decisions.

RATIONALE

A teacher can tell if the students are learning what the teaching objectives call for through measurement of the behavioral responses of the students. The students are not learning if the behavior is not changing. Measurement tells the teacher if the behavior is changing.

There are many different behaviors that teachers are responsible for changing. Most of these are academic behaviors. There are also many ways of teaching the different behaviors which require different kinds of responses to be made. Consequently, different types of measurement are needed to give the teacher adequate feedback on the progress of change in the student's behavior.

The kind of measure to be used must be determined by the kind of feedback the teacher needs. The behavior desired must be stated and criteria determined which provide assurance that the behavior or skill is mastered. Once the criteria for mastery are determined and stated, the type of measurement(s) to be used is/are easily decided. The measurement(s) must be such that it/they will tell the teacher when the criteria have been reached. It is not possible to use the same form of measurement for all behaviors. The form used must be chosen to give the type of information the teacher wants.

TYPES OF MEASUREMENT

Accuracy

The first concern in measuring behavior is whether the behavior, as stated, is being emitted (is occurring) at all. This requires that we measure the accuracy of the responses being made, in comparison to the critera desired. For example, if we want a student to write the correct answers to addition problems, we must measure the extent to which he or she writes correct answers. A useful way of expressing this is in the percentage of answers which are correct. If the student is not writing any correct answers, the first concern is to get some correct responses going. Probably the major concern in teaching a student a new skill is that he or she learn to respond correctly. Thus, accuracy becomes the first necessary measure of any behavior we want a student to learn.

Accuracy continues to be important as long as we are concerned with the behavior. We may need to know other things about the behavior as well, but we never lose the need for an accuracy measure. For some behaviors we do not require that every response be accurate before we assume mastery, but this does not diminish the need for measurement of accuracy.

Use accuracy (percent or ratio of correct responses to total responses) as your single or most important measure when: (1) the student is to acquire (learn) a new behavior not previously known to him or her, and/or (2) you desire the simplest measure possible. Also use accuracy as an underlying requirement for any other measure being used. For example, rate should always be determined by the number of **correct** responses per unit of time. Accuracy of response must be a part of any measure of behavior. The formula for computing accuracy is:

$$\text{Accuracy} = \frac{\text{number of correct responses}}{\text{total number of responses}} \times 100$$

On a spelling test of 40 words one student made eight errors. To determine his or her accuracy score we do the following:

1. Subtract the number of errors from the total possible.
   40 number possible
   -8 errors
   32 correct
2. Divide the number correct by the number possible
   $\overset{.8}{\text{number possible } 40\overline{)32} \text{ number correct}}$
   Multiply proportion correct by 100.
   .8 x 100 = 80% correct

Time and/or Rate of Response

Time is not a measurement of behavior, but it is usually necessary to measure the time which has elapsed while the behavior was occurring. In setting objectives for mastery of skills, the elapsed time during each performance must be measured if the teacher is to know when the criteria have been met. Most teachers have implied time limits for the students to respond or to complete tasks but these are often not stated and not consistent. Time limits for performance of specified behaviors are necessary if there is to be assurance that the tasks are mastered adequately.

When the behavior to be performed is a specific task which is the same each time it is performed, the elapsed time alone is usually an adequate measurement of behavior. Progress in learning the behavior can be determined by measuring the time required for performance of the behavior. A decrease in elapsed time, like an increase in rate, is an indication of improvement or of progress in learning, providing that the accuracy remains constant. For example, if the behavior to be learned is the assembly of a piece of machinery, the first measure necessary would be accuracy. Once accuracy is attained, the time required for accurate assembly becomes the next concern. A decreasing time indicates improvements or progress in learning.

Often in school it is necessary to learn behaviors which are made up of many similar responses to similar stimuli which are presented all at once. For example the student may need to learn the sounds (similar responses) for all the letters (similar stimuli) or the answers to all of the multiplication facts. For tasks such as these it is not practical to present one stimulus at a time and measure the time required for each response. The final skill may be such that many individual responses must be combined to produce the desired behavior. The student may learn the sounds of the letters individually, but in reading he or she must blend them together to produce words. Once again, measuring the time required for each individual response may not be an adequate way of measuring progress. In cases where the behavior is of this type it is more practical to measure the time required for a whole series of responses and then determine the rate of response. The rate then becomes the indication of progress. An increase in rate indicates an increase in progress of learning. If the student has learned the skill better, he or she can perform it at a higher rate.

Rate of response is an extremely useful measurement for many behaviors that are taught in school. There are a few necessary requirements, however, for the *appropriate use of rate of response* as a measure of learning. First, the *behavior being measured must be a free operant behavior.* In other words, the response rate must be under the control of the student. The type of behavior where the teacher presents a stimulus and the student responds, then the teacher presents another stimulus and the student makes another response (e.g. flashcards) would not be suitable for this type of measurement. Here the rate of response is not completely under the control of the student. It is controlled partially by the teacher and partially by the student.

In classroom instruction, one of the things which frequently determines whether a task is free operant or not is whether the stimuli are presented all at once or one at a time. If the stimuli are presented one at a time, the student cannot have complete control of the rate of response. If the stimuli are presented all at once, the rate of response is limited by the ability of the student but not by the manner of presentation.

Another requirement in the use of rate of response as a measure is that the *responses being measured must all be the same response or they must all be of approximately equal difficulty.* For example: in measurement of response to arithmetic problems we could use rate of response if the problems were all of the same type (e.g. single digit addition facts). If there were some single digit addition facts (e.g. 2 + 7 =) and some multiple digit addition facts (e.g. 347 + 976 =) on the same task or assignment, the rate of response (correct answers) would be influenced greatly by the proportion of each type of problem. Unless a different unit of response than correct answers could be found, rate of response would not be an appropriate measure. The reason it would not be appropriate is that the responses are not all comparable. It takes longer to compute and write the answers to multiple digit problems than to single digit problems.

Examples

Example A. A kindergarten teacher teaching colors has six different colored squares on a flannel board. The teacher points to each individually and asks the student the question, "What color is this?"

This requires an oral response and will be presented several different times with the teacher pointing to a different color each time. Rate of response would not be an appropriate measure for this task because the stimuli are presented one at a time so the student must wait for the next question no matter how rapidly he or she answers each question. The teacher must also wait for the student to answer before presenting the next question. The behavior is not a free operant behavior. The responses are approximately equal responses however.

Example B. The same teacher in Example A teaching colors wishes to check the child's learning of the colors, so this time she or he presents all of the colors in a row (six colored squares) and asks the student to say the name of each color as fast as possible. The student may respond from left to right or point to each as he or she says it.

Rate of response would be an appropriate measure here since the only limit on the child's response rate is individual ability. The behavior is a free operant and the responses are approximately equal.

Example C. A sixth grade reading teacher wishes to measure a student's progress in comprehension of literature. The following questions are orally presented to the student by the teacher:

1. What was the name of the main character in the story?
2. Tell the three most important things that happened in the order they occurred.
3. How do you think Bill felt when he realized that he was lost?

Rate of response would not be an appropriate measure for this task since it is not free operant; the questions are presented one at a time. The responses are not approximately equal. The first question requires the student to merely say a name while the second and third require elaboration and explanation.

Example D. A third grade teacher is teaching and reviewing subtraction facts using all combinations where the minuends are any numbers from 1 to 9, the subtrahends are any numbers from 0 to 9, and all differences are single digit numbers.

The teacher has several different drill sheets, each sheet having 50 subtraction problems of the type described above printed on it. One sheet is presented to the student each day. Rate of response is an appropriate measure for this behavior (writing the answers) since it is a free operant; only the student's own skills limit his or her response rate; and the responses are approximately equal.

Example E. In the same class as in Example D, the teacher also has flash cards with the same subtraction facts printed on them. In working with an individual student the teacher holds the flash cards in one hand and picks them up one at a time and presents each card to the student. The student responds as quickly as possible and as soon as he or she responds (says the answer) the teacher presents the next card as quickly as possible.

Rate of response is not an appropriate measure for this task since it is not a free operant. The student must wait for the teacher to present the next card and the teacher must wait for the student to say the answer. Even though it may be possible to perform this task at a high rate, it is still limited by things other than the student's ability. The responses are still approximately of equal difficulty.

In Example E the teacher could make the responses free operant by laying all of the cards out on the table in rows so that all are visible and asking the student to say the answer to each as fast as possible. If the task were presented in this way, rate would be an appropriate measure.

Please do Practice Exercise 3 (page 14) now.

To determine the rate of response, two requirements are necessary: (1) count the number of *correct responses,* and (2) measure the *elapsed time.* The formula is:

$$\text{rate} = \frac{\text{number of responses}}{\text{elapsed time}}$$

When the number of responses and the time have been measured, rate is determined by dividing the number of correct responses by the time: responses per day, responses per hour, responses per minute, or even responses per second. The most practical time unit for expression of rate in school settings is the minute. Rarely, if ever, is a student required to make the same type of responses for an hour or a whole day, and many responses are made in a second or faster so the minute is the easiest measure to use. If it is necessary or desirable, response rates can be converted to any unit of time but experience has shown the minute to be the easiest unit of time to use in describing response rate.

For example, a student read a paragraph containing 92 words in 45 seconds. He or she made two errors. To determine his or her rate, we do the following:

1. Subtract the number of errors from the total number of words (responses)

   92 total responses
   -2 errors
   90 correct responses

2. Divide the number of correct responses by the number of seconds.

   $$\begin{array}{r} \text{2 correct responses per second} \\ \text{number of seconds } 45\overline{)90}\text{ correct responses} \end{array}$$

3. Multiply the number of correct responses per second by 60.

   2 correct responses per second
   x 60 seconds per minute
   120 responses per minute (rate)

Practice Exercise

A student said 105 sounds in 93 seconds but said 21 of these 105 sounds wrong. His or her rate was___________ and his or her accuracy was______________.

You should have calculated a rate of 54 sounds/minute (0.90 sounds/second) with 80 percent (0.80 proportion correct) accuracy. The appropriate calculations are as follows:

105 total sounds
-21 incorrect sounds
84 correct sounds

Accuracy:

$$\begin{array}{r} \text{0.80 proportion correct} \\ \text{105 total sounds}\overline{)\text{84 correct sounds}} \end{array}$$

0.80 proportion correct
x100.
80. percent correct

Rate

$$\frac{\text{84. correct sounds}}{\text{93 seconds}} =$$

0.90 correct sounds/second
x 60. seconds/minute
54. correct sounds/minute

Repeated measurements of student responses allow you to determine and graph changes in the behavior which tell you whether or not the student is progressing.

To determine rate of response on a specific task there are two commonly used ways of *observing responses and time:* (1) fixed time, and (2) fixed task. One way (*fixed time*) is to give a sample of the task to the student and stop him or her after a fixed length of time (e.g. one minute). Count the number of correct responses made, and then divide the number of correct responses by the time. The other way (*fixed task*) is to specify a set task and time how long it takes to perform this specified number of correct responses, then divide the number of correct responses by the time. Both of these methods are useful and both have certain advantages and disadvantages, so it is not possible to say that one is preferrable to the other under all circumstances. From a practical standpoint for a teacher who is dealing with a large number of students (10 or more), it is advisable to use the one that will require the least time per student. Usually on written tasks where all the students can respond at the same time, the fixed time is easier to use. On oral tasks where each student individually completes the task in less than one minute, the fixed task requirements

Practice Exercise 3

Directions

For rate of response to be used as an appropriate measure of performance two requirements must be satisfied: (1) The behavior must be a free operant, that is, one in which the response rate is limited only by the student's ability to respond, and (2) the responses must all be the same or of approximately equal difficulty. In the list of behaviors below, tell whether or not each is a free operant, whether the responses are approximately equal, and whether or not rate of response is an appropriate measurement for determining the learner's progress.

	Stimulus	How Presented	Response	Free operant?		Approximately equal responses?		Rate ?	
				Yes	No	Yes	No	Yes	No
1	Multiplication facts single digit	printed, all at once*	written						
2	Addition facts double digit	printed, one at a time	oral						
3	Letters	printed, all at once	say sounds						
4	Words (3rd grade level)	printed, all at once	say words						
5	Subtraction facts single digit	orally, one at a time	write answers						
6	Words (spelling) (5th grade level)	orally, one at a time	write words						
7	Letters (handwriting)	orally, one at a time	write letters						
8	Letters (handwriting)	printed, all at once	write letters						
9	Questions (reading comprehension)	orally, one at a time	say answers						
10	Questions (reading comprehension, multiple choice)	printed, all at once	circle correct answers						
11	Single digit and double digit multiplication problems	printed, all at once	write answers						
12	Addition, subtraction, and multiplication problems	printed, all at once	write answers						
13	Single digit division facts	printed, all at once	write answers						

*Printed on paper so that the student can see all the stimuli at once.

Criteria

All 13 correct in each of the three categories: (a) free operant, (b) approximately equal responses, and (c) rate.

Answer Key to Practice Exercise 3

	Stimulus	How presented	Response	Free operant		Approximately equal responses		Rate ?	
				Yes	No	Yes	No	Yes	No
1	Multiplication facts single digit	printed, all at once*	written	✓		✓		✓	
2	Addition facts double digit	printed, one at a time	oral		✓	✓			✓
3	Letters	printed, all at once	say sounds	✓		✓		✓	
4	Words (3rd grade level)	printed, all at once	say words	✓		✓		✓	
5	Subtraction facts single digit	orally, one at a time	write answers		✓	✓			✓
6	Words (spelling) (5th grade level)	orally, one at a time	write words		✓	✓			✓
7	Letters (handwriting)	orally, one at a time	write letters		✓	✓			✓
8	Letters (handwriting)	printed, all at once	write letters	✓		✓		✓	
9	Questions (reading comprehension)	orally, one at a time	say answers		✓	can't tell			✓
10	Questions (reading comprehension, multiple choice)	printed, all at once	circle correct answers	✓		✓		✓	
11	Single digit and double digit multiplication problems	printed, all at once	write answers	✓			✓		✓
12	Addition, subtraction, and multiplication problems	printed, all at once	write answers	✓			✓		✓
13	Single digit division facts	printed, all at once	write answers	✓		✓		✓	

*Printed on paper so that the student can see all stimuli at once.

save time. The task and the teaching situation will indicate which method is preferrable.

Summary

Accuracy and time are necessary measurements of all behavior. These two measures are essential if we wish to make decisions about teaching needs and effectiveness based on the performance of the learner.

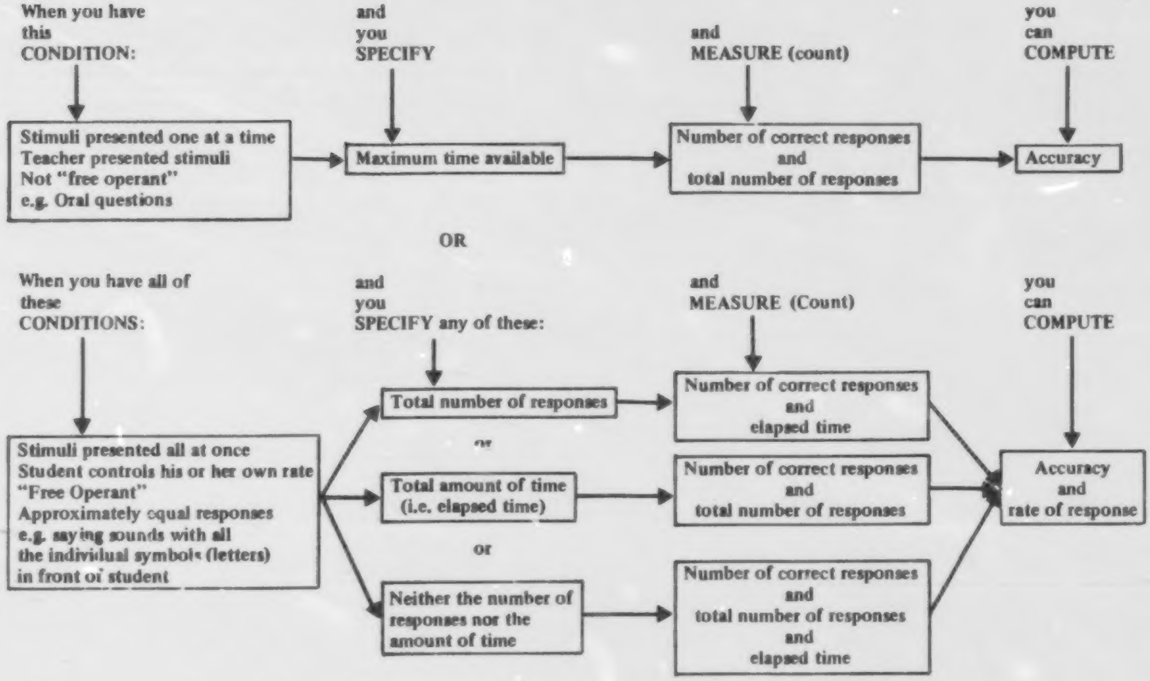
In many cases, one or both of these measures are adequate for what we wish to know. In other cases they are not. We may also need to know about the number of correct responses made in the time required or allotted. By dividing the number of correct responses by the elapsed time, rate of response may be determined. To use rate of response as a measure, we must determine that the behavior is a free operant and that the responses are approximately equal. Rate of response data is usually expressed as responses per minute.

MEASURES TO USE

Essentially there are three things to measure in any demonstration of student performance. They are: (1) Total number of responses. Often this is known in advance. Whether it is known in advance or not depends on whether you wish to evaluate performance on all the stimuli presented, or only on those to which the student responds. (2) Correct responses. (3) Elapsed time.

From the information gained from these three things you can determine accuracy and rate of response. Accuracy (within specified time limits) and/or rate of response are adequate measures for almost all academic behaviors. The classroom teacher in most elementary classrooms will have little occasion to use any other measures in order to obtain adequate feedback on student progress.

DETERMINING RATE AND ACCURACY


When you have this CONDITION:
and you SPECIFY
and MEASURE (count)
you can COMPUTE
Stimuli presented one at a time
Teacher presented stimuli
Not "free operant"
e.g. Oral questions
Maximum time available
Number of correct responses and total number of responses
Accuracy
OR
When you have all of these CONDITIONS:
and you SPECIFY any of these:
and MEASURE (Count)
you can COMPUTE
Stimuli presented all at once
Student controls his or her own rate
"Free Operant"
Approximately equal responses
e.g. saying sounds with all the individual symbols (letters) in front of student
Total number of responses
or
Total amount of time (i.e. elapsed time)
or
Neither the number of responses nor the amount of time
Number of correct responses and elapsed time
Number of correct responses and total number of responses
Number of correct responses and total number of responses and elapsed time
Accuracy and rate of response

Practice Exercise 4

Directions

For the following behaviors tell what you would record and compute. Using the following symbol key, indicate what you would record and compute for each combination of stimuli, method of presentation, and response. Refer to the *Determining Rate and Accuracy* chart, page 16, if necessary. Check your answers with the answer key. If you do not understand any of the answers or disagree with them, reread pages 8-11.

Symbol Key

CR = Number of correct responses
TR = Total number of responses
ET = Elapsed time
AC = Accuracy
RR = Rate of response

BEHAVIOR							
STIMULI	HOW PRESENTED	RESPONSE	RECORD			COMPUTE	
Letters	Printed, one at a time	Say sounds					
Letters	Printed, *all at once	Say sounds					
Words	Printed, one at a time	Say the words					
Words	Printed, paragraph, all at once	Say the words in order					
Words	Orally, one at a time	Written (spell the words)					
Addition facts	Orally, one at a time	Say the answer					
Addition facts	Printed, all at once	Say the answer					
Addition facts	Printed, all at once	Write the answer					
Subtraction facts	Orally, one at a time	Say the answer					
Subtraction facts	Printed, one at a time	Say the answer					
Subtraction facts	Printed, all at once	Say the answer					
Subtraction facts	Printed, all at once	Write the answer					
Multiplication facts	Orally, one at a time	Say the answer					
Multiplication facts	Printed, one at a time	Say the answer					
Multiplication facts	Printed, all at once	Say the answer					
Multiplication facts	Printed, all at once	Write the answer					

*Printed on paper so that the student can see all the stimuli at once.

Criteria

90 percent of total answers correct.

Answer Key to Practice Exercise 4

BEHAVIOR							
STIMULI	**HOW PRESENTED**	**RESPONSE**	**RECORD**			**COMPUTE**	
Letters	Printed, one at a time	Say sounds	CR	TR		AC	
Letters	Printed, *all at once	Say sounds	CR	TR	ET	AC	RR
Words	Printed, one at a time	Say the words	CR	TR		AC	
Words	Printed, paragraph, all at once	Say the words in order	CR	TR	ET	AC	RR
Words	Orally, one at a time	Written (spell the words)	CR	TR		AC	
Addition facts	Orally, one at a time	Say the answer	CR	TR		AC	
Addition facts	Printed, all at once	Say the answer	CR	TR	ET	AC	RR
Addition facts	Printed, all at once	Write the answer	CR	TR	ET	AC	RR
Subtraction facts	Orally, one at a time	Say the answer	CR	TR		AC	
Subtraction facts	Printed, one at a time	Say the answer	CR	TR		AC	
Subtraction facts	Printed, all at once	Say the answer	CR	TR	ET	AC	RR
Subtraction facts	Printed, all at once	Write the answer	CR	TR	ET	AC	RR
Multiplication facts	Orally, one at a time	Say the answer	CR	TR		AC	
Multiplication facts	Printed, one at a time	Say the answer	CR	TR		AC	
Multiplication facts	Printed, all at once	Say the answer	CR	TR	ET	AC	RR
Multiplication facts	Printed, all at once	Write the answer	CR	TR	ET	AC	RR

*Printed on paper so that the student can see all the stimuli at once.

Symbol Key

CR = Number of correct responses
TR = Total number of responses
ET = Elapsed time
AC = Accuracy
RR = Rate of response

Other Measures

The measures of accuracy, time, and rate of response are the most useful and, in combination, adequate measures of most school behaviors. However, there are occasions when other measures are required.

The following information on the other measures is presented for your information and possible future reference. It is not suggested or recommended that you attempt to measure your student's performance using these measures unless you have need for the specific information the measures provide, and accuracy, time, and/or rate will not give you what you need.

One measure of behavior that is often useful is magnitude of response. *Magnitude* refers to the "intensity" of a specific behavior. Many behaviors requiring a physical measurement are measured in feet and inches, or some similar measurement, as is the distance one can broad jump. The weight a person can lift is measured in pounds and ounces. Some of these kinds of measurement are needed for specific behaviors and may have some application in a school setting.

There are also a few behaviors in which the most important aspect of the behavior is the length of time it takes to make the response after the signal or stimulus is presented. An example of this is pressing a brake pedal when the light turns red or when there is a sudden need to stop. In some driver education training, this *reaction time* is the most critical aspect of the behavior. Reaction time measures usually require some kind of specialized equipment. If the equipment is not available, reaction time cannot be measured regardless of how desirable the data might be. Reaction time can sometimes be a useful measure of certain behaviors, but it usually cannot be used in a school setting due to restrictions on the purchase of adequate equipment for measurement, and the limited number of behaviors where reaction time is a significant concern.

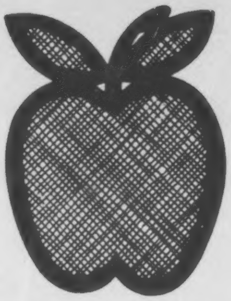
There are occasions, too, where the most needed information about a student's behavior is how it compares with the behavior of others. This is a *normative* type of data requirement. In many cases testing instruments (tests) with normative data acquired during the development of the tests are available and will supply the information through reference to the established norms.

For many specific skills such information is not available. One way to obtain comparative data on such behavior is to set the criteria required for mastery and count the *number of attempts required to reach it.* Through the use of such a measure, data can be obtained to compare performance with that of others or with the student's own performance on other behaviors. This type of data is also useful in evaluating instructional programs and materials. Performance criteria are established for each behavior to be learned in the instructional program and the trials required to reach the criterion are counted for each step for each person. If the data show that some steps require far more trials than other steps for the majority of people who try to learn the behaviors, then there is a good indication that those steps are more difficult than the rest and may need revision.

The following chart summarizes the kinds of measures of behavior that can be used, how each is expressed, the necessary conditions for the use of each, and the appropriate use of each.

MEASUREMENT CHART

TYPE OF MEASURE	HOW EXPRESSED	NECESSARY CONDITIONS FOR USE	APPROPRIATE USE
1. Accuracy	Usually in percent or ratio of correct responses to total responses.	Precise criteria for correct and incorrect must be specified. Each response must be scorable as correct or incorrect.	During the initial acquisition of learning, i.e. presentation of new stimuli calling for previously unknown responses. As a necessary criterion for all other measures. Where simplicity is desired.
2. Time	In minutes, seconds, hours, etc.	The same task must be correctly performed on repeated trials.	Wherever the same task is being performed on repeated trials such as: running the 100-yard dash, writing answers to the same set of multiplication facts, reciting the alphabet, etc.
3. Rate of response	In responses per unit of time.	Behavior being measured must be a free operant. Responses should be of equal or approximately equal difficulty. Responses must be defined so that a high reliability in measuring occurs. Each response must have a discrete beginning and ending point.	Particularly useful in measuring associative learning where rote, automatic response is required. Useful in measuring performance on skills where a high (or controlled) rate of response is a necessary part of the skill.
4. Trials to criterion	Usually expressed in cumulative responses.	A trial must be precisely defined. Correct reponse criteria must be precisely defined.	If normative data on skill acquisition is desired. Particularly useful for evaluating instructional programming.
5. Magnitude of response (physical measurements)	In physical measures such as amount, weight, distance, height, etc.	The necessary measuring devices must be available. The responses must be identical on repeated trials	In a school setting this measure would be most useful in measuring physical skills and motor responses where the criteria for rate measurement do not apply.
6. Reaction time	In elapsed time between presentation of stimulus and completion of response.	Precise measuring equipment must be available. Usually must be electronic and/or automated so that presentation of stimulus activates timer.	Limited use in the classroom; can be used for measuring reaction times in some athletic events or in driving simulation.



Changing Behavior

OBJECTIVE

3. To change student behavior through the application of systematic and scientific behavior change procedures.

RATIONALE

Behavior or performance is the evidence of learning. Changes in behavior indicate changes in learning; therefore, it is the objective of teaching to change behavior. An effective technology for changing behavior exists. It is based on research B. F. Skinner and others have done on learning. The basic principle is that *behavior is controlled by its consequences.* More specifically, the likelihood of future behavior is controlled by the consequences of past behavior. This implies that if *we program consequences, we can, to some degree, control behavior.* Use of the technology first requires that precise behaviors be specified and that a suitable means of measurement for the behaviors be chosen.

CHANGING BEHAVIOR

Behavior can be changed in either of two directions. It can be increased as indicated by the measurement being used, or it can be decreased as indicated by the same measurement. If a learner already behaves or performs in a particular manner, the frequency of this behavior can usually be changed. If the behavior does not presently exist it can be established. The occurrence of a behavior that did not previously exist is an increase from zero occurrence. If a behavior presently does exist, it can be decreased. Thus, two types of changes in behavior are possible—increases and decreases. We shall focus primarily on increasing behavior, or in other words, increasing learning.

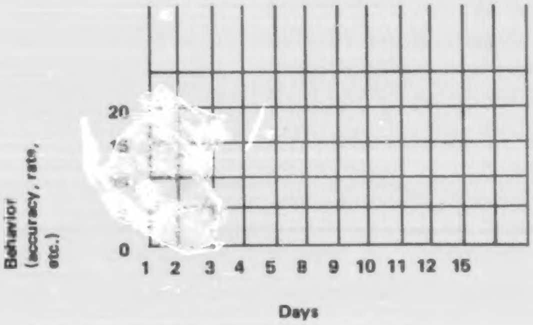
BASELINE

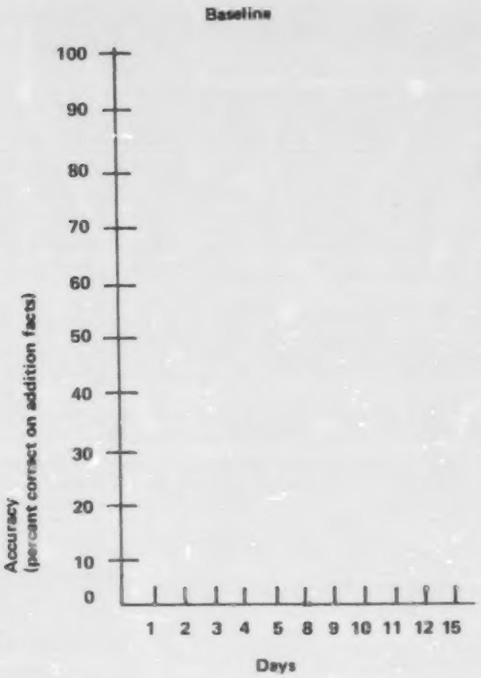
When the behavior has been specified in accurate behavioral terms (see Part 1) and a method of measurement has been selected (see Part 2), it is possible to obtain data on the present strength or level of the behavior. This is referred to as *baseline.* In other words, baseline is the data taken before a new program (treatment) is introduced. It indicates the initial level of the behavior so that the effects of the program change (treatment) can be evaluated by comparing subsequent behavior to baseline behavior. *The conditions under which the behavior is to be measured must be established and should be as similar as possible each time the behavior is measured.* For example, in measuring the behavior of oral reading, the length of the passage to be read should be approximately equal each time, and the difficulty of the material should be the same each time. If you prefer to have the student read for a fixed time rather than reading a fixed amount, the alloted time should be the same each time oral reading is measured. Unless it is your purpose to teach a fixed sequence of behaviors, you should vary (randomize) the order of stimulus presentation while keeping the same level of difficulty to make sure the student is responding appropriately to each stimulus and not merely repeating a rote sequence.

Most systems for the use of behavioral technology in teaching recommend that the behavior be measured daily and that the data be recorded once daily. It is possible to measure and record behavior more frequently, but a busy classroom teacher responsible for many students is limited in the amount of behavior measurement and recording he or she can do.

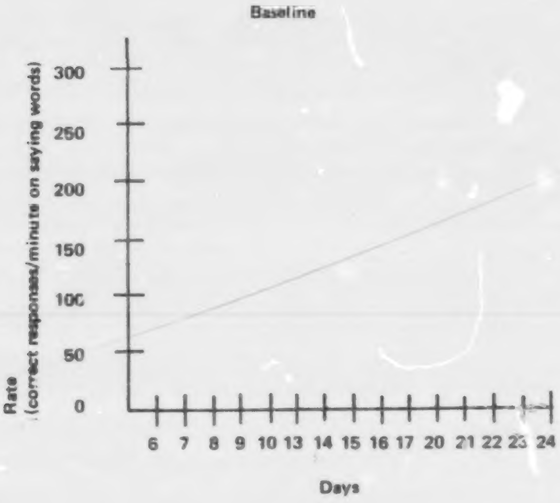
The means of recording and displaying data is *graphing.* Any piece of paper divided into small squares is adequate for most graphing. Specially prepared graph paper is preferred, however. On the graph paper, the horizontal lines going across show the level of performance of the behavior. The vertical lines going up and down which intersect the horizontal lines are the day lines.

The diagram shows a portion of a graph with both the day lines and the behavior lines. The days are numbered from the first to the fifteenth of the month. This would be adequate for recording a student's performance for 11 school days.





The horizontal lines which intersect the vertical axis indicate the level of performance attained on each day. The horizontal lines will be numbered according to the type of behavior and measurement being used. If you are measuring accuracy only, the horizontal lines would probably be numbered from 0 to 100 showing the percentage of correct responses each day. If you are measuring the rate of oral reading, you may need to have a range of 0 to 300 to be sure that you could go as high or as low as the student would ever attain. The 0 to 300 would be the rate (words per minute read) scale for each day's performance.



The step by step procedure for measuring and recording baseline is:

1. Decide upon the behavior you wish to teach.
2. Set the conditions for performance.
3. Decide on the best type of measurement.
4. Hold the conditions as constant as possible from day to day; measure the behavior daily (randomize the order of stimulus presentation).
5. Plot the performance data on a graph numbered especially for the measure being used.

The data is plotted by marking a dot at the point where the measured performance intersects the day line. Then connect the dots (data points) with lines, being careful not to skip any dots. If a student is absent on one or more day(s), no dots are plotted on these absent days. Do not connect dots across dates that have no data plotted. This gives the erroneous impression that the behavior for that day occurred at a rate equal to the point that the connecting line crosses the day line. When you have a day with no data, show a break in your connecting line from the last data point (dot) to the next data points. The diagram on page 23 shows the following data plotted on the graph.

Date	**Rate**
Nov. 3	12
Nov. 4	17
Nov. 5	14
Nov. 6	16
Nov. 7	15
Nov. 10	13

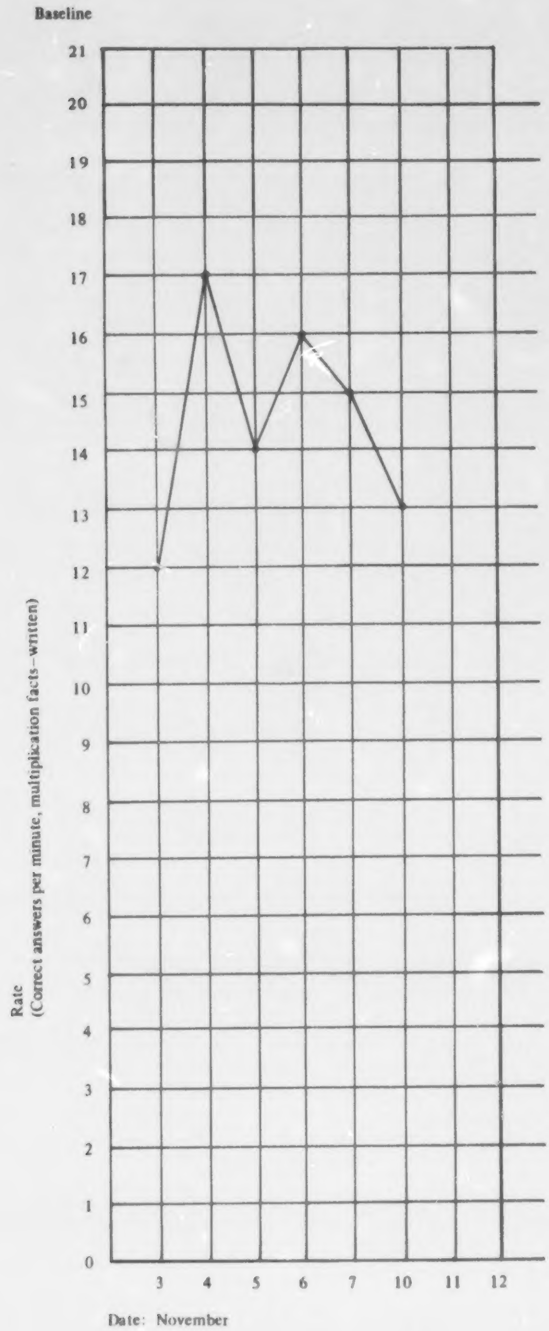
This is how a graph with baseline data recorded looks. The next concern is with how long to continue recording baseline data. The purpose of obtaining baseline data is to tell us the present strength or level of the behavior, so that when we begin specific procedures to change behavior, we can assess the effect of what we do. We should continue recording baseline data until it is evident that the behavior is either stable or that it is random with no particular trend apparent. If the baseline shows a trend, we can still start our instructional program after a reasonable time (from 5-10 days). The effects of our program can be seen as a change in the trend. The sample baseline in the diagram on page 23 shows that the behavior is fairly stable with slight random variability (i.e., slight variation from day to day). Such data would be adequate for baseline purposes.

The chart on page 23 presents a summary of what to do based on the baseline data obtained over a 5- to 10-day period. The chart is presented with the assumption that your goal is an increase in the behavior. If your goal is a decrease in the behavior, the procedures presented in this table do not apply.

Please do Assignment 2 (page 24) now.

REINFORCEMENT

When you have obtained at least five days of baseline data and there is no indication of a strong upward trend in performance, it is time to begin a program of reinforcement



Initial Program to Increase Behavior: Learning

If the data show this	Do this
Stable performance below criterion level, small variability.	Begin your reinforcement program, continue data recording.
Wide variability with no apparent trend, performance below criterion level.	Begin your reinforcement program, continue data recording.
Slight upward trend, small variability, performance below criterion level.	Begin your reinforcement program, continue data recording.
Any downward trend.	Begin your reinforcement program, continue data recording.
Strong upward trend but still below criterion level.	Continue what you are presently doing, do not start new program, continue data recording.
Stable performance or upward trend with performance at or above criterion level.	Move on to the next behavior to be learned, begin new baseline.

to increase the behavior. The procedure for reforcement of a behavior to increase its rate of occurrence is:

1. Continue to measure the behavior.
2. Find something that is highly desirable to the student (i.e. a potential reinforcer) which can easily be provided to him or her at the teacher's discretion.
3. Make the highly desirable event or item available to the student according to consistent predetermined increases in the measured performance of the skill.
4. Make the event or item available as soon as possible after the criterion has been met. *If the data from continued measured performance shows an increase in performance, then we can say that the event or item made available, based on the performance of the student, is a reinforcer for that behavior and for that particular student.*
5. Remember to reinforce the behavior as soon as possible after the increase in performance is measured.

A vast body of research exists which shows that behavior can be increased by making reinforcers *contingent* upon the occurrence of the behavior *(i.e. by delivering reinforcers if, and only if, the desired behavior or the desired increase in behavior occurs).*

Assignment 2

Directions

Measure and record the behavior you identified in Assignment 1 as an important behavior in one subject you teach for one week (five school days). Measure and record the behavior at least once a day, for as many needy students as you think you can manage. Caution: Do not try to measure and record the behavior for so many students that you will have more data than you can handle. After gaining some experience with the procedure, you will be able to handle measurement of behavior for all those who need it. It is recommended that to begin with you measure and record one behavior for not more than five students. Submit a copy of your graph(s) to the instructor with Assignment 2. Keep the original so you can continue to record data on it.

Criteria

1. **The behavior must be stated in correct behavioral terms.**
2. **The method of measurement must be appropriate.**
3. **The data must be correctly graphed for each student.**
4. **The condition must be "baseline" (no specific treatment may be introduced).**

In making the desirable events or items (reinforcers) available for improvement in performance, it is necessary to establish a direct relationship between the performance and the reinforcers. A simple yet effective way to do this is through the use of a contingency table.

A contingency table is a table which shows how much of a reinforcer will be given for various levels of performance.

One important reason for using such a table is to be certain that all students receive adequate reinforcement to keep them responding and learning. This is particularly necessary for the low performing students. The low performer (scholastically) achieves less and consequently is reinforced less through his or her achievement than the high performing student. Actually the low performer needs more programmed reinforcement than the other student since he or she receives less intrinsic reinforcement from achievement. The contingency table provides a means for individualizing reinforcement.

Two types of contingency tables are presented as possible ways of programming reinforcement.

The first type is based on the student's present level of performance and programmed so that increases in performance result in increases in reinforcement. The reinforcement is actually given for improvement in performance. The actual level of performance is unimportant as long as improvement is occurring. An example of this kind of table is given in the following diagram.

Name	Points					
	5	10	15	20	25	
Jimmy M.	15	16	17	18	19	Reading Rate
Larry H.	20	22	24	26	28	
Suzie L.	35	38	41	44	47	
Jenny B.	70	74	78	82	86	
Frankie S.	90	95	100	105	110	

This chart illustrates how Jimmy M., a low performing student whose average rate of reading has been 15 correct words per minute, receives an increase in reinforcement (points) for even slight improvement. He is given five points for maintaining 15 correct words per minute. This is the lowest rate to be reinforced, and it is arrived at from the average of Jimmy's previous week's performance, so the teacher knows that this is a realistic expectation for Jimmy. However, if Jimmy can improve to 16 per minute, he can receive 10 points; for 17 per minute he can receive 15 points, etc. This may appear to be a great deal of reinforcement for a small amount of improvement, and it is. But for Jimmy it is necessary. As he improves and develops better skills and more motivation, the amount of improvement required for increases in points will be gradually increased.

Notice the requirements for Frankie S. who is performing at a high rate of response. He must make an increase of five words per minute for an increase of five points. Frankie's high performance shows that he is capable of this kind of responding.

Both Frankie and Jimmy are being challenged by the requirements for reinforcement assigned to them. Each is competing only with his own previous performance, and each is adequately reinforced for his improvement. Frankie may very soon reach the criterion rate set for him of 120 correct words per minute. At that time he will be awarded all 25 points for maintaining that level of performance as the instructional material gradually increases in difficulty.

Note that the other students listed on the table are reinforced for different amounts of improvement. The amount of improvement required for an increase in performance is based on the past performance of the student and the teacher's judgment of what is necessary and reasonable for that student.

In using this type of contingency table, the following guidelines will be helpful: (1) use the previous week's average as the lowest requirement; (2) require smaller amounts of improvement for lower performing students than for higher performing students; (3) as the student attains moderate gains, gradually increase the amount of improvement required for each increase in reinforcement; (4) when the student reaches the performance standards set for mastery, give maximum reinforcement for maintaining that level of performance; (5) as mastery is attained on one behavior and the student is moved to a new behavior, anticipate a drop in performance and adjust reinforcement requirements accordingly.

A second type of contingency table is one in which a fixed level of performance is required and an increasing number of points is given for each consecutive day the performance requirement is met. An example of such a table is given in the following diagram.

Name	Requirement	Day					
		1	2	3	4	5	
Jimmy M.	20wpm	2	4	9	15	20	Points
Larry H.	25wpm	2	4	9	15	20	
Suzie L.	40wpm	2	4	9	15	20	
Jenny B.	75wpm	2	4	9	15	20	
Frankie S.	100wpm	2	4	9	15	20	

Using this type of contingency table, the thing that is individualized is each student's requirement for reinforcement. It is different for each student and is based on previous performance and the teacher's judgment as to what the student can reasonably be expected to achieve. The requirement for each student would be reassessed every week and increased as necessary. This procedure is recommended when students are performing well some days and very poorly other days. The increasing number of points available for meeting criterion on successive days provides added incentive for good performance each day.

For either system, the long range purpose is the same: (1) to provide sufficient reinforcement to every student on an individualized basis in a manner which makes it possible for the low performing student to be reinforced as much as the high performing student, and (2) to gradually raise the criterion to where each student eventually attains mastery of the skill.

Token Reinforcement System

One easy method for managing the amount of reinforcement earned and received is the establishment of a *token system.* Many kinds of token systems have been used successfully, but the easiest to design and manage is a *point system.* In such a system (a) specified number of points are awarded for specified levels of performance, and (b) specified numbers of points are required for various reinforcers. In this type of system it does not become necessary to change requirements if you desire to change the reinforcer(s) being used. The points are similar to a money system. Points have some advantages over other tokens. A few of the advantages are: they cannot be lost or stolen, they require no tangible objects, no storage is necessary, they are not playthings, and they help to bridge the gap between performance and pay-off time. Many tokens such as poker chips, play money, plastic tokens, pieces of paper, etc., do not have these qualities, and their use often creates additional management problems. In constructing point cards, be sure to include rows and/or columns for points earned, used, and remaining. For example, a local bankbook ledger might be used. To simplify bookkeeping, try requiring students to spend their points at the end of the day, or even at the end of each period.

For example,

Name____

Month______	1	2	3	4	5	6
Points earned						
Points used						
Points left						

The student earns points according to the completed tasks meeting the specified criteria. These points are later exchanged for reinforcers according to the reinforcement menu. Each reinforcing event or item has a specified number of points required for its possession, much like an admission price or rental fee.

Reinforcer	Amount/time	Points
1. Listen to radio	5	10
2. Read comic books	5	8
3. Play math game	5	10
4. Macrame	5	15
5. Work puzzles	5	5

Reinforcing Events

To motivate the student to work hard and learn the tasks so that his or her performance will improve often requires strong reinforcers. In other words, the events made available to the student for his or her points earned by good performance must be exchangeable for things the student values highly. If the points earned cannot be traded for something desirable, the student will not put forth the effort to earn the points. The teacher cannot assume that because something is desirable to most children, it is desirable to all children. When you have made the event contingent on improved performance and the performance does in fact improve, then you can assume that the event is a reinforcer for the behavior. For example, Robert and Scott are both doing poorly on the multiplication tables. The teacher tells them both that if they can do their multiplication problems correctly at a rate of 20 per minute they can go 5 minutes early to recess. Scott works hard and receives early recess. Robert does not do any better than he had been. Early recess is a reinforcer for Scott but not for Robert.

If the behavior is not increasing, the events programmed are not reinforcing for that behavior for that student. If the behavior is increasing, the events are reinforcing.

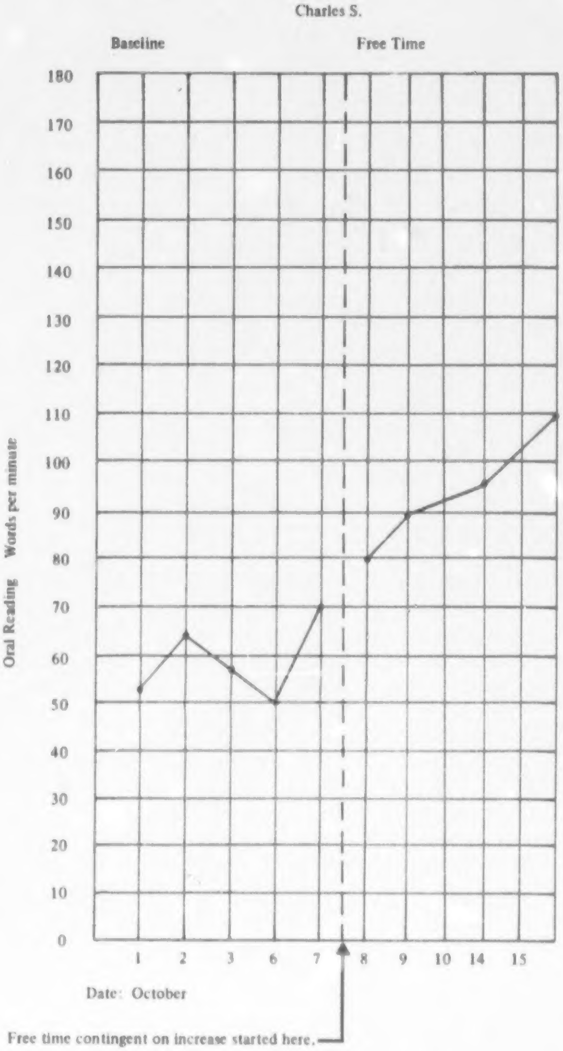
Graphing Program Changes

Whenever you change your instructional program or environment such as by making special events (reinforcers) available for improved performance, indicate on your graph that you have done this. This is easily done by drawing a dashed vertical line at the point on the graph where the change occurred. For example, note the graph on the next page. Free time was made available to Charles S. for improvement of his oral reading rate after October 7. The vertical line is drawn between October 7 and 8. In addition to drawing dashed vertical line on the graph, you should also write in what change has been made. Note that on the graph for Charles S. the words "free time" have been written to the right of the dashed line. After drawing in the dashed line and writing the change made immediately to the right of the dashed line, continue graphing as you did during the baseline period.

If the graph paper lines are too close together to permit drawing a dashed line, draw a solid vertical line on the day line to indicate where the change was introduced.

In the following examples tell whether or not the consequence chosen is reinforcing.

Example A



Free time contingent on increase started here.

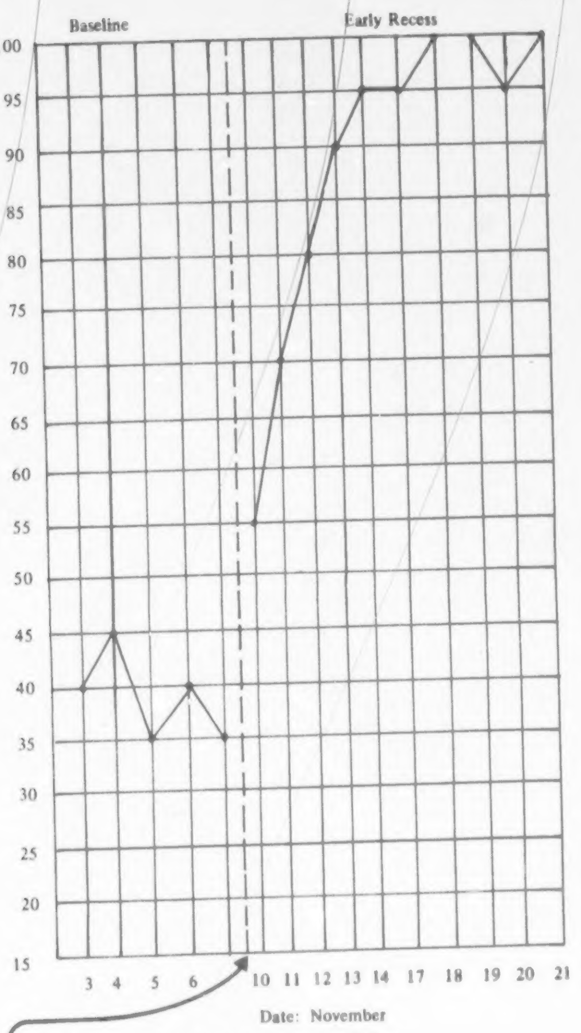
Is free time a reinforcer for increasing Charles' oral reading rate?

☐ Yes ☐ No

Yes, the increasing reading rate shows that free time is a reinforcer for Charles S.'s reading behavior.

Example B

Bob W.



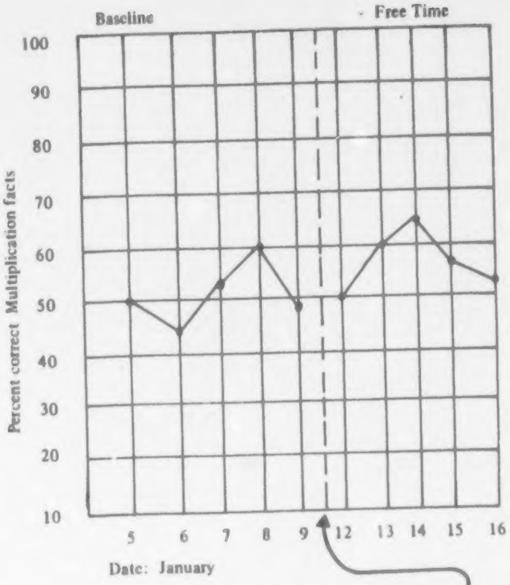
Early recess contingent on increase started here.

Is early recess a reinforcer for correct answers for Bob? ☐ Yes ☐ No

Yes, early recess is a strong reinforcer for Bob W's multiplying behavior.

Example C

Susan P.



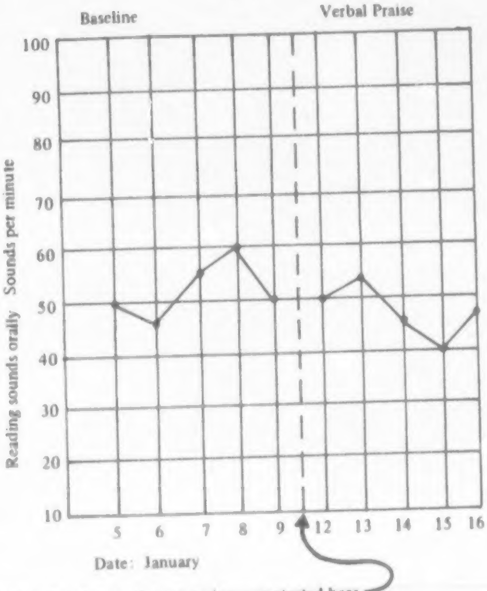
Free reading time contingent on increase started here.

Is free reading time contingent on increase in accuracy of multiplication facts a reinforcer for Susan?

Yes ☐ No ☐

Example D

Jerry



Verbal praise contingent on increase started here.

Is verbal praise contingent on an increase in rate a reinforcer for Jerry?

Yes ☐ No ☐

In Examples C and D, the relatively unchanged graphs of both students demonstrate that free time is not a reinforcer for Susan's multiplying, and verbal praise is not a reinforcer for Jerry's sound reading rate under these particular conditions. Caution should, however, be exercised in generalizing to other conditions; all you can say with certainty is with these students, at this time, under these contingencies, with these behaviors, these events are not reinforcers.

It is important to be sure that the consequences you select do, in fact, reinforce the behaviors you want to increase. If the behavior does not increase, change the consequence until you find something that does increase the behavior. If after varying the reinforcer, the behavior still does not improve, try requiring smaller units of behavior for reinforcement.

If, while varying reinforcers, you find one that the child appears to be making an effort to obtain but is not reaching the criterion for reinforcement, perhaps the steps to criterion are too large for the child at this time and should be reduced.

Choosing Reinforcers

One way to increase the probability that the events you choose for reinforcers will actually function as reinforcers is to have a variety of events available and allow the student to choose from the things available. Students know what they like more than adults do, so the chance of providing an effective reinforcer the first time is greatly enhanced if the student chooses it himself or herself. It is also important that potentially strong reinforcers (things having a high value to the students) be included in the list of things from which they may choose. Many token reinforcement programs that were otherwise well designed have failed because of lack of strong reinforcers.

Here is a list of things that have proven successful with many students and which are readily available. Select those things for use as reinforcers that you think will have high appeal and which you can obtain and manage easily.

POTENTIAL REINFORCER LIST

Playthings

Use of, or access to, playthings may provide reinforcement to many children. Some examples are:

toys
cartoons
kaleidoscopes
flashlight
headdress
rings
striped straws
kickball
playground equipment
tape recorder
badges

stamps
whistles
bean bags
jumping beans
masks
straw hats
banks
address books
fans
silly putty
toy musical instruments

pins
ribbons
balls
puzzles
combs
comics
jump ropes
balloons
commercial games
bats
marbles
toy jewelry
jacks
yo-yo's
plastic toys–(animals, Indians, soldiers)
money (play, real, exchangeable)
class pictures
household inexpensives (pots, cans, cardboard boxes)

birthday hats
play dough
dolls
dollhouses
make-up kits
trains
stuffed animals
pick-up sticks
cowboy hats
boats
blocks
miniature cars
snakes
stickers–STP, forestry, etc.

Physical Contact or Proximity–Approval

patting shoulder
touching arm
straightening clothes
hugging
touching hand
shaking hands
squeezing hand
patting cheek
helping put on coat
ruffling hair
walking alongside
combing hair
tying shoes
quick squeeze
gently raising chin

leaning over
touching hurt
putting face next to child
tickling
cupping face in hands
gentle pull at hair
guiding with hand
nudging
eating with children
sitting on desk near students
standing alongside
walking among students
gently guiding
interacting with class at recess

Words and Symbols, Written–Approval

Bravo
Improvement
Fine
Good
Neat
Very good
O.K.
Thoughtful
100%
Good paper
Very colorful
Well done
Great
Wow
A-1
Perceptive

Good work
Correct
+
Satisfactory
Nicely done
Very concise
Complete
Enjoyable
Excellent
Outstanding
Superior
Congratulations
Yeh
Show this to your parents
For display
(rubber stamps)

Expressions of Approval–Facial

looking
smiling
winking
nodding
grinning
raising eyebrows
opening eyes
slowly closing eyes
signaling o.k.
thumbs up
shrugging shoulders

widening eyes
wrinkling nose
blinking rapidly
giggling
whistling
cheering
laughing
chuckling
skipping
shaking head

Activities and Privileges–Individual Approval

leading student groups
representing group in school activities
displaying student's work–any subject matter
straightening up for teacher
putting away materials
running errands
caring for class pets, flowers, etc.
collecting materials–papers, workbooks, assignments, etc.
choosing activities
show and tell–any level
constructing school materials
dusting, erasing, cleaning, arranging chairs, etc.
helping other children–drinking, lavatory, cleaning, etc.
reading a story
working problems on board
answering questions
outside helping–patrols, directing parking, ushering, etc.
classroom supervision
first in line
assisting teacher to teach
leading discussion
making gifts
recognizing birthdays
correcting papers
special seating arrangements
responsibility for ongoing activities during school holidays (pets, plants, assignments)
decorating room
presenting hobby to class
"Citizen of the Week" or "Best Kid of the Day"

Social

movies
decorating classroom
presenting skits
playing records
puppet shows
preparing for holidays
making subject matter game
outdoor lessons
visiting another class
field trips
planning daily schedules
musical chairs
performing for PTA
dancing
going to museum, fire station, court house, picnics, etc.
participating in group organizations (music, speech, athletics, social clubs)
talking periods
recess or play periods
parties
talent shows (jokes, reading, music, etc.)
competing with other classes

Things, Approval–Access to, Turns, Use of Things Coupled with Approval

storybooks
pictures from magazines
college materials
counting beads
paint brushes
papier-mache
book covers
crayons
coloring books
paints
records
flash cards
surprise packages
bookmarkers
pencils with names
seasonal cards
pencil sharpeners
subject matter accessories
pencil holder
stationary
compasses
calendars
buttons
pins
pictures
musical instruments
drawing paper
elastic bands
paper clips
colored paper
pets
flowers
classroom equipment
chalk
clay

Food

It can be an excellent reinforcer on occasion but should not be used regularly by the classroom teacher.

Reinforcers Which Are Available in Almost Any Classroom

1. praise
2. self-graphing
3. daily good reports to parents
4. model building
5. field trips
6. messenger boy
7. party after school
8. class proctor
9. nurse's helper
10. cafeteria helper
11. library time
12. lunch counter
13. stars on paper
14. papers on wall
15. get to sit by friend
16. class leader to bathroom
17. class leader to cafeteria
18. smiles from teacher
19. pat on back by teacher
20. happy faces on paper
21. library passes
22. chance to help other students
23. music pass
24. magazine selection
25. choose a game
26. extra privileges
27. picnic
28. teacher for the day
29. game equipment manager
30. clean chalk board
31. stamps on a hand
32. read to younger children
33. listen to records
34. cross walk patrol leader
35. flag raiser
36. first turn
37. sharpen pencils for class
38. roll call leader
39. sit in front of classroom
40. sit in back of classroom
41. sit by windows
42. sit by door
43. feed classroom animals
44. turn lights on and off
45. self-selection of activity

Home Reinforcers

The teacher may find these as useful suggestions to make to parents.

1. money
2. candy
3. gum
4. verbal praise
5. pat on back
6. extra TV time
7. extra time before going to bed
8. watch more TV shows
9. new clothes
10. extra play time
11. new toys
12. entertain friends
13. extra helping at dinner

14. choose a particular food
15. go to a movie
16. go to zoo
17. records
18. swimming
19. time outside
20. parties
21. coloring
22. carbons
23. get a pet
24. charting
25. soda
26. friend to spend the night
27. opportunity to go out for sports at school
28. have friend over for dinner
29. choose TV program
30. increase allowance
31. play game with parents
32. have a picnic
33. make something in the kitchen
34. have breakfast in bed
35. washing and drying dishes
36. wrap Christmas gifts
37. choose gift for friend or sibling
38. fewer chores
39. sleep later on weekends
40. go on errands
41. go out to a special restaurant
42. watch dad shave
43. choose own clothing to wear
44. choose own hair style
45. go to summer camp
46. buy something for car
47. open the mail
48. take pictures of friends
49. make something for teacher
50. put soda in refrigerator
51. use Dad's tools
52. not have to wash clothes for week
53. not have to iron own clothes for week
54. piggieback ride on dad
55. start fire in fireplace
56. work to go to circus
57. lick stamps for green stamp book
58. help dad make dog house
59. put things on wall
60. slide down banister rail

Assignment 3

Directions

Choose at least a dozen things from the list provided or that you think of yourself which you have available. Get them ready so that you can use them. This should not include social reinforcers such as praise and personal interaction. Be sure you have at least a dozen things besides social reinforcers. Make a list of the items you have.

Criteria

1. At least 12 potential reinforcers must be available. More than 12 is better.
2. The available potential reinforcers must appear to have a high probability of being desirable to children the age of those in your class.

For the same behaviors on which baseline data was obtained in Assignment 2: Answer each question yes or no. If you answer any question "no," do the thing indicated in the "if no" column.

Checklist for Beginning a Reinforcement Program

Question	Yes	No	If No
1. Have you selected a behavior that is observable, verifiable, and measureable?			Select a behavior that is observable, verifiable, and measureable. Ask a friend or colleague to verify that it is observable (see Part 1).
2. Have you selected an objective method of measurement for this behavior?			Select an objective measurement for use with this behavior (see Part 2).
3. Have you observed, measured, and recorded this behavior for five days under the same conditions each day (baseline)?			Observe, measure, and record the behaviors for at least five days under the same conditions each day (see Part 3, through Baseline).
4. Have you made up a contingency table (for the students needing to increase this behavior) showing how much reinforcement, in points or free time, each student may earn for specified levels of performance?			Make up a contingency table for each student showing performance levels and how much reinforcement is available for each level.
5. Do you have at least a dozen items, to be chosen by the students, available and ready for use in your classroom?			Bring reinforcement items into classroom ready for use (see Part 3; Reinforcement and Potential Reinforcer List).

When you have answered yes to all of the questions on the checklist, start the reinforcement program. Explain to the students what is happening and how they may earn points or free time by better work. Present it to the students in a positive way. Avoid any negative comments or consequences.

Assignment 4

Directions

For the same behaviors on which baseline data was obtained in the previous assignment:

1. Select events or items that you think will be highly desirable to students.
2. Inform the students that the items or events are available to them on the basis of an increase in the measured performance of their behavior (skill) as specified on the contingency table.
3. Award the events or items to the students on the basis of their measured performance as immediately as possible.
4. Continue daily measurement and recording of performance data.

Criteria

1. A contingency table must be drawn up having:
    a. the students' names on the left,
    b. the name and magnitudes of the reinforcer on the top,
    c. the behavior being measured on the right with its units, and
    d. the required amounts of behavior in the boxes within the body of the table.
2. The daily graphs of the students must be plotted having:
    a. the behavior measured with its units on the left,
    b. the time (e.g. days) on the bottom,
    c. dots (i.e. data points) plotted appropriately,
    d. lines connecting the dots,
    e. vertical dashed line separating baseline from treatment conditions, and
    f. the baseline condition labeled "baseline" and treatment conditions labled with the name of the program change (e.g. tokens).

If the performance shows an increase in behavior, the events or items delivered to the students are reinforcers. If the behavior does not show an increase, try making other events or items contingent on improvement and continue measuring and recording the data. Continue this procedure until you observe an increase in performance.

MAKING THE SYSTEM WORK

When the behavior to be improved has been clearly specified and is being adequately measured, reinforcers are provided, and contingencies for reinforcement established, you have the beginning of a successful program. How well it works will depend on how you manage it. Some important teacher behaviors to be developed are:

Be Consistent

A contingency table is a contract. The student is promised specific rewards or payments (points or free time) for certain behaviors. *When these behaviors occur the specified consequences must follow* immediately. Even if some other behavior of the student annoys or upsets you, you must still provide the reinforcement if the specified behavior has occurred. Example: Mike has been promised (on the contingency table) 10 minutes free time for reading orally at a rate of 75 words per minute. His oral reading rate is 78 words per minute. He immediately yells out in a sing-song voice, "Hey teach, you owe me ten minutes." This behavior and the term "teach," along with the taunting tone of voice, annoy the teacher; she gives him the free time, and tries not to show her annoyance with the inappropriate verbal behavior. To make the system work, this is an indispensable requirement. You must deliver what the contingencies promise if the student delivers what the contingencies require of him or her. *Failure to do this is a virtual guarantee that the system will not work.*

Be Positive

Expect the student to succeed and make what is required of him or her within reachable limits. Praise the student for success. (A more detailed treatment of appropriate verbal behavior for the teacher is given later). Always state goals, performance levels, contingencies, and consequences in positive terms. Example: Jim's average reading rate for the past week has been 63 words per minute. This number is the lowest rate for which he can receive free time this week. In telling Jim this, say, "For a rate of 63 per minute, you earn 5 minutes free time." Do *not* say, "If you get less than 63 per minute you don't get any free time." Negative statements in this context means grammatically negative (i.e. containing "not"), not necessarily negative consequences.

Vary Your Reinforcers

A teacher who is to be most successful in using a token reinforcement system is always seeking out new reinforcers. No matter how desirable any given reinforcer might be to any individual, it is almost always possible to get tired of it if it is used too much. This is referred to as satiation. The way to avoid satiation and still provide strong reinforcement is to provide a variety of reinforcers and keep adding new events or items to the available pool from which the student may choose. The major limitation on what may be used as reinforcement is usually the imagination of the teacher. Children have interests in widely diverse areas. They are usually open to trying out new things that have reinforcement potential. Do not consider the list of potential reinforcers supplied with this unit as a complete list. It only gives suggestions. The world is full of reinforcers; the job is finding the ones you can use and manage in the classroom. Anything your students might like that you can provide access to is a potential reinforcer. Try out unusual things. Be creative in selecting reinforcers.

APPROPRIATE VERBAL BEHAVIOR

What the teacher says to the students while teaching them has a strong effect on their behavior and their learning. It is important to be sure that the verbal interaction and comments reinforce the same things being reinforced by the token system. Each time performance is measured, or reinforcement is given, positive verbal comments should accompany the information given to the student. Some examples of *positive verbal comments* are given in the suggestions for reinforcers. Others might include such things as: "Good work, Jim, your rate is five per minute higher today." "Excellent, Bob, you get 15 points today." "That's the way to study, Linda, you'll soon have your work finished."

Verbal praise may be given simply for good study habits, punctuality, practicing, or any behavior you wish to reinforce. The major common misuse of praising is praising behaviors which are not worthy of praise. Do not call something good which is obviously bad. If the student knows it is bad and the teacher calls it good, the teacher's credibility suffers. Find the good in a behavior and praise it *specifically*. It is not likely that any teacher will give too much genuine praise. It is a fact that many teachers do not give enough praise; however, this situation is easily remedied. Post reminders for yourself and/or have data taken on your rate of praising while attempting to give more praise.

While verbal praise may be used for almost any behavior you want strengthened, it is essential that it accompany the reinforcement given on the token system. Don't just award points or free time for good performance without giving praise at the same time. By *giving the praise and tokens together* you are pairing praise with other reinforcers so that ultimately praise alone may be sufficient. *A goal in all reinforcement should be that ultimately the behavior will be controlled by the natural reinforcers associated with it, rather than by reinforcers introduced by the teacher simply to increase the behavior.* This will not likely occur, however, until the student has gained enough success in the subject so that the success itself becomes reinforcing. So be as consistent as possible in giving praise and awarding tokens while teaching the students, especially when introducing new behavior.

TEACHER ATTENTION

Numerous studies have demonstrated the powerful effect of teacher attention on student behavior. Most teachers have known this for a long time. What is not always recognized, however, is that even unfavorable attention tends to reinforce the behaviors associated with it. If the teacher pays attention to a student who talks out, only when he or she talks out, the talking out is likely to increase. Becker, Engelmann, and Thomas (1975) illustrate dramatically how a teacher's verbal behavior controlled the behavior of a class in regard to standing up. They would sit down when told to but would soon stand up again, only to be told to sit down again. Because of the fact that teacher attention to any behavior tends to increase that behavior, it is important that the teacher attend to (both verbally and otherwise) the behaviors he or she wants to teach. Look for the behavior you want and reinforce it. One important question the teacher should always ask in regard to any student is: "What do I *want* the student to do?" It is difficult to overcome the natural tendency to attend to the inappropriate behavior and not respond to appropriate behavior. Even though it is difficult to respond only to the desired behavior, it can be done. It requires practice and self-monitoring. At least one teacher appointed a student to record the number of positive and negative comments she (the teacher) made each class period. The teacher could then see the progress in her own behavior of learning to praise more and criticize less. At the end of each period the student reported the teacher responses to her. This also served as a consequence for her verbal behavior during class. Other school personnel such as teaching assistants, aides, counselors, psychologists, or principals might be willing to collect similar data providing they were approached properly. Data collection sheets should include spaces for subject's name, recorder's name, date, starting time, stopping time, number of positive comments, and number of negative comments.

PLANNED IGNORING

Just as it is important to respond to appropriate student behavior to maintain or increase the behavior, it is also important not to respond to inappropriate behavior (e.g. "offtask" behavior, verbal disruptive behavior, etc.). Inappropriate behavior should not be reinforced through teacher attention. Ignoring inappropriate behavior is necessary if that behavior is to decrease or cease. Ignoring inappropriate behavior is not easy for most people and there are some behaviors which cannot be safely ignored, but a great deal of inappropriate behavior that goes on in most school classrooms is reinforced by teacher attention. One first grade teacher often had a number of children at her desk saying, "Teacher, teacher," and asking for attention for usually unimportant things. It seemed that no amount of telling them to sit down and not to call her "teacher" helped. When she realized that her own attention was reinforcing this behavior in the children, she stopped attending to them and called on children to speak only when they were sitting in their seats with their hand raised. The problem vanished within a few days.

The rule is *attend to those behaviors you wish to reinforce. Ignore all others unless the safety of the class or some individual is threatened.* Once you begin to ignore a behavior, be as consistent as possible in ignoring it. (Usually you don't actually ignore the behavior. You are well aware of its occurrence and may even be keeping data as to its occurrence, but you don't respond to the behavior. Perhaps a more precise term would be "nonresponding.")

There are many occasions on which inappropriate behavior is maintained by the attention of other students even though the teacher ignores it. The most satisfactory way to deal with such behavior is to reinforce (reward) these other students if they do not respond to the inappropriate behavior. If you have a token (point) system in effect, it is easy to glance around the room at the time the inappropriate behavior occurs and give the students who are not responding to it points for doing the work they are supposed to be doing. For example, the class clown has just made a loud noise to attract as much attention as possible. The teacher looks at the class and sees that Terri is working and not responding to the noise. The teacher says, "I like the way Terri is doing her arithmetic. Terri, you may have an extra point for good working." Then she catches three or four more students working and gives each of them a point for good working. If she is consistent in doing this, the class clown will soon have no audience and the clowning will decrease.

The verbal behavior of the teacher is extremely important in the management of the student. It should not be all spontaneous. The behaviors praised and the behaviors ignored should be carefully chosen and responded to consistently. Always praise good performance in school assignments. Wherever possible, ignore inappropriate behavior. If the teacher's verbal behavior reinforces the same behaviors that the token system does, and if these reinforcers are used consistently, good performance will increase and inappropriate behavior will decrease.

Please do Assignment 5 now.

Assignment 5

Directions

1. **Define specifically with at least five appropriate examples:**
    - a. **positive comments**
    - b. **negative comments**

*2. **Record on a card or a counter (golf counter, etc.) all of your own**
    - a. **positive comments**
    - b. **negative comments**

    for at least 30 minutes (the same 30 minutes for both) per day for one week.

*3. **Record how many times you respond in any way to inappropriate behavior for 30 minutes per day for one week. This does not need to be the same 30 minutes as in #2 above.**

***A student may do the recording for you providing that you train him or her properly before starting.**

Criteria

1. **Each type of comment must be appropriately defined.**
2. **Data must be graphed.**

***If you have a student record the data, submit a report on the training of the student.**

DECREASING BEHAVIOR

Just as systematic use of consequences can increase behavior through reinforcement, systematic use of consequences can decrease behavior through extinction or through reinforcement of incompatible behavior.

There are three basic approaches to decreasing behavior and in order of preference for use in a classroom they are reinforcement of incompatible behavior, extinction, and punishment.

Reinforcement of Incompatible Behavior

The behaviors that a teacher might be interested in decreasing are those which interfere with the student's learning the things he or she should be learning. The most common behaviors that teachers want to decrease in students are talking out (at inappropriate times and without permission), and being out of seats at inappropriate times. The behaviors that are incompatible with these two behaviors are the task-related behaviors required for mastery of the curriculum. If talking out or out-of-seat behaviors are problems, the best thing to do is establish or increase the reinforcement being given for improving performance in school subjects. If the student is working hard enough to improve his or her performance in school work, he or she has little time to devote to talking out or being out of seat, or any other undesirable behavior. If, however, there are long periods of time when no work is expected of the student, or if there is little or no reinforcement for working, the inappropriate school behaviors are likely to increase.

Extinction

Extinction is the process of stopping or withholding reinforcement for a specified behavior. When the reinforcement is no longer available, the behavior will gradually decrease until it occurs at a low rate or not at all. *Extinction should be used in conjunction with reinforcement of an incompatible behavior.* If the behavior to be decreased is talking out during arithmetic period, reinforce better performance in arithmetic and withhold reinforcement for talking out.

There are some difficulties in the use of extinction. One difficulty is in determining what is reinforcing the behavior that you wish to decrease. Many inappropriate classroom behaviors are maintained by attention from other people; some are not. In using extinction on attention-maintained behavior, you must systematically ignore the behavior and continue to measure its occurrence.

If the behavior decreases, the extinction procedure is effective, which then tells you that the reinforcer was indeed the attention. If the behavior does not decrease, you still have not found the reinforcer so you must try something else. Another difficulty in the use of extinction is that it is slow. When reinforcement is withheld there is usually *an initial increase in the behavior, and then a gradual decrease* until eventually the behavior is extinguished. This increase followed by a gradual decrease is often discouraging to the teacher who may become impatient and give up the procedure before it has time to be effective.

Another important consideration in the use of extinction (as in reinforcement) is *consistency.* If you are withholding reinforcement and become inconsistent and allow the behavior to be reinforced again, it is strengthened even more with every reinforcement, thus working against your intended objective. While there can be no doubt that extinction is effective, it is not sufficient in many situations to attempt to use extinction as your only method of decreasing behavior. Children do not do nothing for any long duration of time. You cannot decrease behavior without increasing a more appropriate behavior and end up with the results you are seeking.

Punishment

Punishment is either (a) the presentation of some aversive stimulus or event contingent upon a response (e.g. a spanking), or (b) taking away a reinforcer (e.g. a fine). While punishment is not recommended as a means of controlling the behavior of school children, there are situations where its use may be justified. In the case of aggressive behavior of some type where there is danger of injury to another person, you may have no alternative procedure.

The research on the effects of punishment have shown that a mild punishment is followed by a temporary decrease in the rate of responding. Severe punishment is followed by a longer period of low response rate. Since it is not possible for a teacher to use any punishment other than mild punishment, the best that can be expected is a temporary decrease in response rate. If this time of lowered response rate is then used to teach and to reinforce more appropriate behavior, the punishment may have served its purpose.

There are many cautions to be observed in the use of punishment. There is always the legal question of the use of punishment. Never attempt to control student behavior or to reduce undesirable behavior through punishment without knowing the legal consequences. Another effect of punishment must be considered as well before choosing punishment as the means of control; that is, the emotional effects on the student and the fact that many times other undesirable and unpredictable behaviors occur when punishment is used. Many escape and avoidence behaviors are often associated with punishment and many times these behaviors are unpredictable and even irrational. One more effect of punishment that must be considered is the association of the punishment with the teacher. The teacher who metes out punishment comes to be identified as an aversive person to be avoided. The use of punishment may prevent or destroy a good personal relationship between teacher and student. Punishment should be used *only* to prevent harm or injury, and then only when more appropriate student behaviors are taught and reinforced in place of the one being punished.

Summary of Ways to Decrease Behavior

1. The first and preferred means of decreasing undesirable student behavior is to reinforce appropriate behavior. If the appropriate behavior is also incompatible with the undesirable one, so much the better, but often it is effective even though the behavior being reinforced is not necessarily incompatible; it simply assumes a higher probability of occurrence.
2. Along with reinforcing appropriate behavior, remove or withhold reinforcement for the behavior you wish to decrease. Attention maintains many inappropriate behaviors, so ignoring is a successful treatment for many, but not all, undesirable behaviors.
3. Use punishment only in the event of imminent harm or danger to the child or another person as a result of a student's behavior. Along with the punishment, teach appropriate behavior to the student and reinforce the student when it occurs.

INCLUDING THE WHOLE CLASS

At this point you may have some concerns about the use of data collection and reinforcement with only a selected group of students. An alternative to this is to include all the students in your class in the procedure. There are skills that every student needs to master in addition to the few you have already identified. There are also behaviors that you can reinforce in each student. They need not be the same behaviors for every student.

The following are suggestions for incorporating these procedures into a class of about 30 students:

1. Identify an academic skill for each student to work on. It is easier to work within one subject area such as reading or arithmetic.
2. Using the contingency tables, determine what the student must do in order to be reinforced for the skill. The same reinforcers and reinforcement system you have already established may be a basis for your entire class.
3. When working with a large group of children, it may be easier to manage a reinforcement system which involves group activities. Each student still earns points based on his or her individual performance. The points then apply to the group activity. Suggested activities include a class party, field trips, a treasure hunt, and movies. Students should be active in the selection of the activity.
4. Teach your students to do their own graphing. A procedure for doing this might include: (1)

Enlarge a section of your graph. Put it on an overhead. Also ditto enough copies so each student has one. (2) Use those two materials to teach the class how to use the graph. There are three main skills the student must have: (a) be able to identify the correct day line, (b) be able to identify the correct response line, and (c) be able to plot the score on the intersection of the correct day and response line. (3) Have the students plot at least five scores. (4) Check each student's work, then have the students begin graphing their own scores. Be sure to monitor them occasionally.

5. Here are two further suggestions about graphing. First, you may want to use a larger size graph paper for younger children. Secondly, post the graphs on a bulletin board. Children have easy access to the graphs, and it is easy for you to monitor as they record their scores.
6. Implement the procedures with your entire class.

As you continue using this system, the skills you wish the students to improve upon will change. They will master the first skill. At this point, have the students draw a dashed line on the graph to note the program change. Then begin working on the new skill. These changes will occur at different times for different students.

If there is not a consistent improvement in the student behavior, it may be necessary to make some changes in your reinforcement system. These may include changing the type of reinforcer, changing the amount of the reinforcer available upon completion of the task, and changing the frequency with which the student can get the reinforcer. These changes can be noted on the contingency table and on the graph.

References

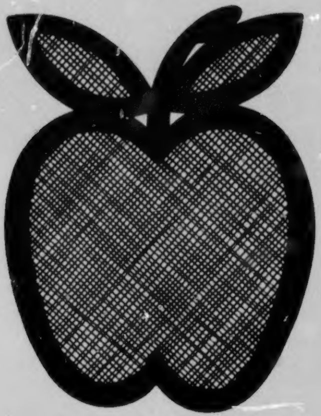
Becker, W., Engelmann, S., & Thomas, D. *Teaching I: Classroom Management.* Chicago: Science Research Associates, 1975.

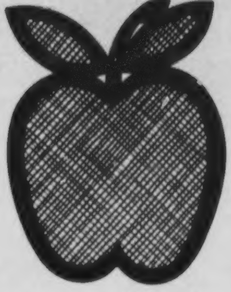
Dunn, Lloyd M. Special education for the mildly retarded–is much of it justifiable? *Exceptional Children,* September 1968, *35* (1), 5-21.

Hammons, Gary W. Educating the mildly retarded: A review. *Exceptional Children,* March 1972, *38* (7), 565-569.

Part II.

Instructional Planning and Individualization





Instructional Planning

INTRODUCTION TO INSTRUCTIONAL PLANNING

Purpose of the Unit

The purpose of this unit is to present a method for organizing regular classroom instruction into a written instructional plan to provide a basis for individualizing instruction for students *with* or *without* learning problems.

Definition of Individualized Instruction

Individualized instruction as used in this unit refers to a system of instruction containing the following essential elements:

1. The skills and/or knowledge to be mastered in the subject are specified.
2. Criteria for mastery of each skill and/or knowledge are specified.
3. Activities for instruction and practice on each skill and/or knowledge are provided.
4. The order of progression through the skills is prescribed.
5. Each student must demonstrate mastery of each skill.
6. The students may demonstrate mastery of the skills as fast as their capabilities allow or as slowly as their limitations require.

Definition of an Instructional Plan

An instructional plan is a written outline for an entire subject area. It includes the following:

1. A listing of the topics and subtopics to be taught in the subject area.
2. A listing of the skills to be taught for each topic and subtopic.
3. A description of the procedure and materials needed to test for learning of each skill listed.
4. A statement of the performance criteria that define the learning of each skill listed.

Uses for Instructional Plans

An instructional plan provides the content structure for individualized instruction from which:

1. Units of instruction for individuals and small groups of students can be developed.
2. Student graphs and record keeping systems can be developed.
3. Instructional materials can be selected, adapted, or developed.
4. Daily progress tests and unit tests to determine student learning directly can be constructed.

STEPS FOR WRITING AN INSTRUCTIONAL PLAN

Step 1

Select a subject area for which you wish to write an instructional plan.

Choose a subject area for which you have no individualized instructional program. If you already have both individualized math and reading programs, choose the area of math or reading with which your students have the most difficulty. If you do not have an individualized math or reading program, choose one topic within these subject areas first.

Step 2

List the topics and subtopics of the subject area for which you will present instruction during the school year.

Examples of topics and subtopics from the area of math:

Topic:	Subtopic
Matching:	One-to-one correspondence
Counting:	Rote
Counting:	Objects
Numerals and symbols:	Reading
Numerals and symbols:	Writing
Equality rule	

a. Some topics may be small and you will not need to divide them into subtopics (see equality rule in the example above).
b. The number of topics and subtopics you include for a subject area may depend upon the grade level you are teaching and the skills of the students assigned to you. Here is a general guide for including *math* topics and subtopics on your list.

If you are teaching	Include topics and subtopics for
Grades K or 1	Grades K-2
Grades 2 or 3	Grades K-4
Grades 4, 5, or 6	Grades 1-6

c. List first the topics and subtopics in the subject area that you think are *essential* for students to learn. Mark these in some way.

d. List next the topic and subtopics of somewhat lesser importance.

e. Arrange all topics and subtopics in order from simple to complex, *if the subject matter permits.* It is relatively easy to list topics and subtopics for math in this manner. For subject areas such as science or social studies it may not be possible or necessary. Here are some examples of a partial listing of reading and math topics and subtopics.

Subject Matter Area	Topic	Subtopic
Reading	Decoding	Saying letter sounds Blending Reading irregular words Sentence reading Paragraph and longer passage reading
	Comprehension	Following directions Answering questions Sequencing story events Summarizing Drawing conclusions Interpretation
Arithmetic	Addition	Adding "1" to single digit numbers Adding two single digit numbers Problems with missing addends Adding three or more single digit numbers
	Fractions	Identifying 1/2, 1/3, and/or 1/4 of a set Identifying the printed fractions 1/2, 1/3, and 1/4 Dividing sets of elements into halves, thirds, or fourths

Please do Assignment 6 now.

Assignment 6

Directions

1. **Select a subject matter area, a topic, and related subtopics for which you would like to plan some instruction. Choose a topic that is large enough that you will have at least three subtopics.**
2. **Write the subject area, topic, and all the subtopics necessary for student mastery of the topic on the Instructional Planning Sheet. Use the Instructional Planning Sheet included on page 46 as a model.**

Criteria

a. **The topic must be part of the subject area.**

b. **The subtopics must be a smaller part of the topic.**

c. **The list of subtopics should include all skills necessary for student mastery of the topic.**

Step 3

For each topic and related subtopic, list all of the specific skills that students will be expected to learn.

a. On an instructional plan, specific skills for each topic and subtopic are written in behavioral terms. They are called *skill statements.* They may be written as complete sentences.

b. We said a skill statement is written in behavioral terms. That means it contains the following:
   (1) The stimuli which are presented to the students,
   (2) How the stimuli are presented, and
   (3) The response required of the student.

c. Here are explanations of what we mean by *stimuli, how stimuli are presented, and responses students are directed to make.*
   (1) Stimuli include any things that can be experienced through the senses. Examples are printed materials of any type, objects, tape recordings, records, films, etc.—anything being used for instruction that can be seen, heard, touched, tasted, or smelled. It is necessary to specify the limitations of the stimuli to be used.
   (2) How stimuli are presented to students means instructional stimuli are printed; spoken; shown; placed in front of, near, handed to the student, etc.
   (3) *Responses students are directed to make* include writing, saying, operating, moving themselves or objects, pointing, reading orally, etc.

d. In the examples shown below, the stimulus and the response students are directed to make is indicated for two skills.

Examples

(1) A teacher plans to teach rote counting from 1-10 to a student. The following response and stimulus have been identified:

(a) Response: the student counts orally

(b) Stimulus: the teacher *tells* the student to count from 0-10.

The stimulus and response can be developed into a skill statement as follows:

The student counts orally when told by the teacher to count from 0-10.

(2) A teacher plans to teach the sounds for each of the letters of the alphabet to a student. The following responses and stimulus have been identified:

(a) Response: the student says sounds.
(b) Stimulus: the teacher presents each letter(s) of the alphabet printed on an individual card.

The stimulus and response can be developed into a skill statement as follows:

The student says the sound for each letter(s) of the alphabet printed on an individual card as the teacher presents them.

Practice Exercise 5

Here are two exercises where you can practice developing skill statements.

(1) In the following exercise, write the skill statement. A teacher plans to teach a student to write addition facts from 4 + 0 through 4 + 9. The following responses and stimulus have been identified:

a. Response: the student writes answers
b. Stimulus: a paper with 20 addition problems with combinations from 4 + 0 through 4 + 9

The stimulus and response can be developed into a skill statement as follows: ______________________

____

____

Check your answers with those in the next column

(2) In the following example, write the response, the stimulus, and the skill statement.

A teacher plans to teach addition problems which have two addends with two digits each and which involve carrying. Identify the response and stimulus.

a. Response: ______________________

____

b. Stimulus: ______________________

____

The stimulus and response can be developed into a skill statement as follows:

____

____

____

Check your answers with those in the next column.

Answer Key
to Practice Exercise 5

1. Your skill statement should be similar to the following answer:
The student writes answers to 20 addition problems with combinations from 4 + 0 through 4 + 9.

2. The answers to this exercise follow:
a. Response: the student writes answers
b. Stimulus: a paper with 20 addition problems with two addends having two digits each and carrying.

Skill statement: the student writes answers to 20 addition problems with two addends having two digits each and carrying.

e. A well written skill statement communicates the same information to all teachers reading it. That is, there should be little or no doubt concerning the stimuli, how those stimuli are to be presented, or what responses students will be directed to make.

When there is doubt about the stimulus and/or response desired for a skill, it is necessary to revise it so it is clear to all who use it.

Step 4

For each topic and subtopic you have listed, arrange the skills in order, if possible, from easy to difficult.

Topic/subtopic		Skill statement
Counting: Rote	1:	Given a stated number in the 0-99 range, the student counts orally from 0 to that number.
	2:	Given a stated number in the 0-99 range, the student counts orally from that number until stopped by the teacher
	3:	Given two stated numbers in the 0-99 range, the student counts orally from the first number to the second number.

Example of three skills for a topic and subtopic arranged in order from easy to difficult.

a. When skills within a topic and related subtopic are arranged from easy to difficult, one can determine which skills must be taught first.

b. Any skill that must be learned *before* a student is able to learn more difficult skills is called a "prerequisite skill."

c. In the example presented above, skill 1 is a prerequisite for learning skill 2. Both skill 1 and 2 are prerequisites to learning skill 3. And skill 3 is a prerequisite for learning skills in more difficult topics and subtopics.

d. Arrange the skills in each of these sets in order from easy to difficult. Give the number 1 to the easiest skill in the set and so on.

Practice Exercise 6

SET A

______ Given the letters of the alphabet printed in groups of three in consonant vowel consonant order, the student blends the sounds into nonsense words.

______ Given letters of the alphabet, printed individually on cards, the student says the sound of each as it is presented.

______ Given a printed list of regularly spelled words, the student reads them orally.

SET B

______ Given a series of printed empty boxes with different numbers of lines beneath each (0-10), the student counts the number of lines for each.

______ Given two stated numbers in the 1-10 range, the student counts from the first number to the second number.

______ Given two printed numbers separated by a blank (5___7) the student completes the equation by making a less than, greater than, or equal to sign (>,<,=) in the blank.

______ Given the equation in the form 2 + 4 = □ or □ = 2 + 4, the student draws the correct number of lines under each given numeral, counts the total number of lines, and writes the corresponding number in the box.

e. It should be noted that *not all* skills that a student needs to learn in order to perform a more complex skill are prerequisites to each other, as in the example just shown. That means that while prerequisite skills may be related to each other, no one of them *must* be taught before the others. They may be learned in any order just as long as they are learned *before* the student attempts to master a skill which requires them.

In the next example, the three skills are all prerequisites to a more complex skill, but are not prerequisites to each other.

Answer Key to Practice Exercise 6

Set A: 2, 1, 3

Set B: 2, 1, 3, 4 or 2, 1, 4, 3. This is an illustration of point "e" above. The order of the last two items under "B" can not be precisely determined.

Examples of skills that are prerequisite to a more complex skill but not to each other:

In order for a student to solve a math problem in the form 7 - □ = 3, the student must have learned previously the following skills:

(1) Rational counting – counting from 1 to 10 objects.

(2) Reading numerals – reading numerals from 1 to 10.

(3) Writing numerals – writing numerals from 1 to 10 (this skill is necessary only if a written response is required).

Now look at your Instructional Planning Sheet located at the end of the unit. The area to attend to is at the left and looks like this:

SKILL STATEMENT

Response	Stimulus

As you identify the response and stimulus for each skill in your topic and sequence it, fill in these columns of the Instructional Planning Sheet.

Please do Assignment 7 (page 42) now.

Step 5

For each skill listed on your Instructional Planning Sheet, write an assessment procedure and indicate the materials needed.

a. Here are some concepts regarding assessment procedures:

 (1) Assessing students on individual skills is simply checking student progress frequently, and recording the results of the checking. Frequently means every day or every other day.

Assignment 7

Directions

On the Instructional Planning Sheet, under the column labeled "skill statement," write the response and stimulus for each subtopic listed.

1. **Skill statements must be written in the form used throughout this unit with:**
   - a. **The stimuli to be used in instruction and the method of presentation, and**
   - b. **The responses students are directed to make.**
2. **Skill statements should be arranged in the sequence in which they will be taught.**

Criteria

- a. **Responses must be observable, measurable, and verifiable behaviors.**
- b. **The order in which the skills are taught must be such that no skill is required before it is taught.**

(2) Assessment is the first step in instruction on skills. Before beginning instruction, assess whether or not the student already has the skill. If not, proceed with instruction. If the student does have the skill, assess whether or not he or she has the next skill.

(3) Assessment can be used to: (a) report student progress to the student, to other teachers, and to parents, (b) check on the effectiveness of one's instructional methods and materials, and (c) determine when the student has attained mastery of the skill.

b. When writing the assessment procedure and preparing materials for testing a particular skill, there are *two critical considerations:*

(1) The type of stimuli used to test the skill and the responses students are directed to make must *match* the type of stimuli and responses written in the skill statement.

Example

Skill Statement. The student writes answers to 20 addition problems with two addends having two digits each and carrying.

Assessment Procedure. Present a page containing 20 addition problems, two addends each, with carrying. Tell the student to write the answers as rapidly as possible.

(2) The numbers of items to be included in the assessment procedure depends upon the type of skill being tested.

(a) There are certain basic skills for which the student must be able to respond correctly to every stimulus. Some examples of these skills are:

All of the letter sounds for reading
All of the answers to the basic math facts for addition, subtraction, multiplication, and division
All of the names of number symbols, 0-99
All of the names of letters of the alphabet
All of the names of the basic math symbols — =, +, x, –, >, <

For skills of this type, test on every stimulus. If there are too many stimuli to present for testing at one sitting, break them into groups of 30 stimuli or fewer and test on two or more successive occasions.

(b) Other basic skills represent processes or concepts, and we test students on *randomly selected* stimuli because it would not be possible to test students on every possible combination of stimuli. Examples of process and concept skills are:

Addition of three digit numbers with carrying
Addition of prefixes and suffixes to root words
Selection of broad leaf plants from a mixed group of plants
Spelling words with final silent "e"
Reading whole words with regular and irregular spellings
Measuring the dimensions of various objects
Telling the correct time to the hour and minute on a clock

For skills of this type, select a random sample of three or more stimulus combinations. Generally speaking, the more test items are included, the greater will be your confidence about the student's true mastery of a particular process or concept.

Step 6

For each skill listed on your instructional plan, write the *measurement criteria* you will use to indicate student learning of the skill.

a. Measurement criteria include both the *accuracy* and the *rate of response* measurement you select for a skill

Practice Exercise 7

Listed below are several skills from different subject matter areas. Next to each, place either an A if the skill is one for which you should test on all of the stimuli or a B if the skill is one for which you should test on a random sample of stimuli.

1.______Subtraction of two digit numbers with borrowing.
2.______Naming the parts of the human digestive system.
3.______Making change from a dollar bill.
4.______Writing the letters of the alphabet in manuscript.
5.______Stating the equality rule.
6.______Reading a weather thermometer.
7.______Writing paragraphs.
8.______Reading math symbols.
9.______Underlining verbs in sentences.
10.______Naming U.S. coins and bills.

Please check your answers below

Answer Key to Practice Exercise 7

1. B
2. A
3. B
4. A
5. A
6. B
7. B
8. A
9. B
10. A

If you missed two or more items in the exercise, please read pages 41 and 42.
If you missed less than two items in the exercise, continue with Assignment 8.

Assignment 8

Directions

On the Instructional Planning Sheet, under the column labeled "assessment" write the procedure and materials for assessing the skills you have listed.

Criteria

a. Assessment procedures and skill statements must *match* in terms of stimuli and methods of presentation, and responses students are directed to make.
b. The number of items tested must match the number specified in the skill statement.

and the *minimum performance* you will accept as evidence of student learning.

b. Here are some examples of measurement criteria written for particular skills. Measurement criteria are listed after materials on the Instructional Planning Sheet, but they apply to the learning and practice of a skill as well as assessing that skill.

Example

I. Assessment procedure: The teacher presents the 100 basic addition facts, printed in random order on worksheet. The student writes the correct answer for each.

Criteria:
Measurement: Accuracy and rate of response.
Minimum performance: 100 percent accuracy at a rate of 30 per minute

II. Assessment procedures: When asked to do so by the teacher, the student writes a list of all the human digestive organs.

Criteria:
Measurement: Accuracy and rate of response
Minimum performance: 100 percent at a rate of six per minute.

III. Assessment procedures: The teacher presents a sample of 10 two digit multiplication problems printed on a sheet of paper. The student writes the correct answer beneath each problem.

Criteria:
Measurement: Accuracy and rate of response.
Minimum performance: 90-100 percent correct at a rate of three per minute.

It may be helpful to review the chart titled *Determining Rate and Accuracy* on page 16.

c. There are few strict rules for establishing minimum performances with accuracy and rate of response measurements. The best that can be offered are some general guidelines.

ESTABLISHING MINIMUM PERFORMANCES

Accuracy

Require 90-100 percent correct for process and concept skills of which only a random sample of the possible stimuli will be tested.

Require 100 percent correct for basic and prerequisite skills of which every stimulus will be tested.

Rate of Response

Set the minimum acceptable rate at the measured rate of a skilled student.

EXAMPLE	MINIMUM PERFORMANCE	
	Rate of Response	Accuracy
Saying the sounds of letters on 40 cards all of which are laying on a table in front of the student.	120 per minute	100 percent correct
Writing the names of each mammal beneath its pictures on a page of 30 pictures of different mammals	6 per minute	90-100 percent correct
Writing a grammatically correct sentence with each of the 10 words written on the board.	1 per minute	90-100 percent correct
Counting orally to 100 by 2's.	60 per minute	100 percent correct

d. Some general guidelines for establishing minimum performance on skills have been discussed for *accuracy* and *rate of response* measurement. It should be noted that when students are *learning* or *practicing new skills*, the level of *performance required for* reinforcement should be set low and then adjusted upward until the student can perform at the criteria (i.e. the minimum performance level).

e. Several assessment procedures are printed below. Beneath each one, write the measurement (*accuracy* or *accuracy and rate of response*) that seems most appropriate. Then write in minimum performance criteria that you might use to determine when students have learned the skill.

Practice Exercise 8

(1) Assessment procedure: The teacher presents all 100 basic multiplication facts (1 x 1 to 10 x 10), printed in random order, on a worksheet. The student writes the correct answer for each.

Measurement: ____________________

Minimum performance: ____________________

(2) Assessment procedure: When asked to do so by the teacher, the student says the names of all of the letters of the alphabet in the correct order.

Measurement: ____________________

Minimum performance: ____________________

(3) Assessment procedure: The teacher presents a 100-word reading selection for which the student knows all the words. The student reads the selection orally.

Measurement: ____________________

Minimum performance: ____________________

(4) Assessment procedure: The teacher points to each of the 50 states in the U.S.A. The student says the correct name of each state pointed to by the teacher.

Measurement: ____________________

Minimum performance: ____________________

Please check your answers with those below

Answer Key to Practice Exercise 8

1. **Measurement: Rate of response and accuracy.**
   Minimum performance: 30-40 answers per minute with 100 percent accuracy.
2. **Measurement: Rate of response and accuracy.**
   Minimum performance: 50-70 letters per minute with 100 percent accuracy.
3. **Measurement: Rate of response and accuracy.**
   Minimum performance: 120-140 words per minute with 100 percent accuracy.
4. **Measurement: Accuracy***
   Minimum performance: 100 percent accuracy.

***Rate of response should not be measured here since this behavior is not a "free operant." That is, the resultant rate would not be solely determined by the student; it would depend partially on how quickly the teacher pointed.**

Assignment 9

Directions

On the Instructional Planning Sheet, under the column labeled "criteria," write the measurement (accuracy and rate of response) and the minimum performance for each skill you have listed. Upon completion of this assignment, all columns of the Instructional Planning Sheet should be completed. Send the Instructional Planning Sheet and the materials made for Assignment 9 to the instructor for evaluation.

Criteria

a. Measurement chosen must be appropriate for the skill as specified in Unit 1, Behavior Measurement and Change. If student responding is free operant, rate and accuracy must be used.
b. Minimum performance must meet the accuracy standards listed on page 16.
c. Minimum rate of response, if used, should be high enough to assure mastery.

INSTRUCTIONAL PLANNING SHEET

Subject Area Arithmetic

Topic

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Rote counting	The student counts orally, in sequence, from 0-10	Teacher's command to orally count from 0-10	The teacher tells the student to count orally, in sequence from 0-10.	Timing device	100 percent accuracy 100 number per minute (within 7 seconds)
Rational counting	The student orally counts sets of objects numbering from 1-10.	Teacher's command to orally count sets of objects.	Three different times, the teacher presents a set of objects numbering from 1-10. Each time the student is told to orally count the objects in the set.	Ten objects.	100 percent accuracy 1 object per second.
Identifying numbers	The student orally identifies printed numbers from 0-10.	Numbers from 0-10 printed on individual cards.	The teacher presents numbers from 0-10, printed on individual cards, in random order, and tells the student to say each number. All numbers presented at the same time.	Individual cards with the numbers from 0-10 printed on them.	100 percent accuracy 100 numbers per minute (within 7 seconds)
Writing numbers	The student writes numbers from 0-10 in proper sequence	Teacher's command to write numbers from 0-10 in sequence	The teacher tells the student to write the numbers from 0-10 in sequence.	Timing device	100 percent accuracy 40 numbers per minute

INSTRUCTIONAL PLANNING SHEET

Subject area______________________ Teacher's name____________________

Topic______________________________

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA

INSTRUCTIONAL PLANNING SHEET

Teacher's name____________________

Subject area ____________________

Topic______________________________

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA

CRITERION REFERENCED TESTING

The assessment of student skills and progress is directly related to the instructional sequence specified on the Instructional Planning Sheet. This assessment does not refer to the formal testing programs commonly employed in the school systems. It does refer to the assessment of student progress related to specific learning tasks. This approach to the assessment of student skills is usually called criterion referenced testing.

You have already looked at behavior and the application of the behavior in an instructional plan. How do you know that the student can emit (perform) the behavior required at the particular placement step in the instructional plan? The student response to the stimulus is the behavior which is tested. Since student behavior usually falls into one of two categories, *motor or oral responses* and *written responses*, each will be dealt with separately.

Motor and Oral Responses

The first type of response the students may give to an assignment is either *motor or oral.* In either case, it requires the observation of the actual event. The behavior is emitted by the student and the teacher records the data as it is observed, usually in a one to one situation. The procedure for this type of testing follows:

1. Specify the student behavior.
2. Determine the criteria (performance standard) for passing.
3. Observe the student's performance of the task.
4. Determine if the student met the criteria.

The decoding of words in reading is a good example of this. To determine the student's placement in oral reading, have the student read a selection from a book at the level of difficulty that you think the student can handle. The student should be able to read the selection with 95 percent accuracy at a rate of at least 100 words per minute. If the student meets the criteria for that level, try more difficult reading material until you find a level where the student begins to have either more errors or a slower rate.

On the other hand, if the student reads the selection more slowly than the stated criteria or makes more errors, give the student less difficult reading material until the stated criteria can be met. In either case, the student should begin instruction at the reading level where criteria were met, but where the next material is either too difficult or too easy, based on observation of the student's performance. This insures some initial success for the student in the instructional program.

With skills such as decoding, asking the student to perform the *actual behavior* is the most efficient means of using criterion referenced testing. If the student meets the criteria previously set, move on to the next task. If not, and the prerequisite criteria for the skill have been met, the student should be placed at this point in the instructional sequence. It should be noted that the criteria established for the assessment of the behavior is the same as the criteria the student must meet for mastery.

Additional examples of oral and motor skills which should be tested by actual student performance are:

bowling
handwriting
eating
soap carving
drawing geometric figures
shoe tying
backward roll
cooking
cutting on a lathe
reciting poetry
saying multiplication facts
running
etc.

Practice Exercise 9

Oral Response

From the following skill statement, specify the standard of performance the student must meet to show mastery of the skill.

Given a stated number in the 0-99 range, the student counts orally from 0 to that number.

Standard of performance:

Your answer should include the following:

100 percent accuracy,
minimum rate of one number per second,
the number of test items used to determine if the student can do the counting task,
random selection of the stated numbers

At least five different test items are recommended for this skill.

Practice Exercise 10

Motor Response

From the following skill statement, specify the standard of performance the student must meet to show mastery of the skill.

When asked by the instructor, the student performs a forward roll on the mat.

Standard of performance: ________________

Your answer should include the following:

Length of time allowed for each forward roll,

Number of trials possible,

How many of the rolls the student mus complete correctly, and the specifi behavior — i.e. head tucked under, rolls in a straight line, ends standing o feet, etc.

It may be necessary to design a form for recording the responses of the student even though you are personally observing the event (oral reading, running, handwriting, etc). If other data are recorded on a graph (rate or accuracy), the form may not be necessary. The information on the form would help you evaluate the performance of the student, based on predetermined criteria, as well as provide you with a record of the date, time, and actual performance of the event by the student. However, it is usually sufficient to record the data on a checklist which indicates the objective and the date of completion by the student.

Written Responses

The other type of response a student might give is a written response. This applies to most situations where academic work is concerned. In this case it is usually more efficient to measure the response of the entire group at one time. The behavior can be demonstrated on a paper and pencil task. The student records the responses on the supplied test form. Instead of observing the behavior, the teacher must correct the responses given by the pupil to determine: (1) if the student can provide the required answer for each instance, and (2) if the student responded correctly in enough instances to meet the criteria for the particular test. An example of this type of test is included on the next page. The criteria for the test is that the student writes 60 digits in one minute with 100 percent accuracy.

Other examples of areas where written tests may be more efficient than the actual observation of the behavior are:

Placing the names of the [illegible] on a map
An essay
Listing of the [illegible] necessary to conduct an experiment
Writing spelling words which are presented orally by the teacher

A written test need not be considered a formal test. Its format can be as varied as the subject areas you wish to teach. Too often teachers see a written test as one which has a multiple choice or true-false format. It may have these formats. For many areas, however, other formats are more effective. A written arithmetic test may simply be a sheet of problems. A written map test may be the labeling of cities on a map. Do not let the multiple choice or true-false format limit your use of written tests.

There are some general guidelines for preparing these written tests.

1. Determine the specific area to be tested.
2. Prepare an outline of the content area to be covered.
3. Specifically state the objectives to be tested from within this area.
4. Specify the item format.
5. Write the test items.
6. Determine the acceptable standard of performance for each item.
7. Determine the scoring procedures to be used in determining what skills the student must be taught.
8. Determine the acceptable standard of performance for the entire test.

For additional information on specific test formats (multiple choice, fill in, matching, essay, etc.), see *Preparing Criterion Referenced Tests for Classroom Instruction*, by Norman E. Gronlund.

Now return to the copy of the Instructional Plan which you developed. Note that you have listed the procedures, materials, and criteria for assessing each skill. The next step is to make the materials for assessing the skill. Concentrate on the response required of the student and the materials you listed as necessary for assessing the skill. The student response and the type of materials will determine whether the skill is a motor or oral response or a written response. Based on that distinction, specify the conditions for motor or oral responses and construct the assessment materials for written responses for each skill on the Instructional Planning Sheet.

SAMPLE MULTIPLICATION TEST

Name______________________________ Date____________________ Correct________ Errors________ Rate______

1x7=____	8x7=____	1x7=____	10x7=____	1x7=____	7x7=____	0x7=____	Total digits (10)
9x7=____	7x7=____	0x7=____	10x7=____	10x7=____	7x7=____	5x7=____	(23)
10x7=____	9x7=____	3x7=____	6x7=____	9x7=____	5x7=____	9x7=____	(37)
4x7=____	2x7=____	5x7=____	1x7=____	4x7=____	10x7=____	6x7=____	(50)
0x7=____	7x7=____	10x7=____	8x7=____	9x7=____	4x7=____	5x7=____	(63)
5x7=____	2x7=____	2x7=____	6x7=____	7x7=____	10x7=____	7x7=____	(77)
3x7=____	10x7=____	3x7=____	4x7=____	8x7=____	8x7=____	7x7=____	(91)
3x7=____	1x7=____	4x7=____	2x7=____	5x7=____	8x7=____	3x7=____	(104)
1x7=____	6x7=____	0x7=____	10x7=____	3x7=____	2x7=____	1x7=____	(115)
2x7=____	2x7=____	0x7=____	2x7=____	6x7=____	9x7=____	10x7=____	(128)
6x7=____	4x7=____	4x7=____	5x7=____	6x7=____	3x7=____	7x7=____	(142)
8x7=____	0x7=____	10x7=____	8x7=____	10x7=____	9x7=____	8x7=____	(155)
7x7=____	10x7=____	6x7=____	3x7=____	2x7=____	10x7=____	4x7=____	(169)
9x7=____	1x7=____	6x7=____	7x7=____	8x7=____	7x7=____	3x7=____	(182)
1x7=____	10x7=____	10x7=____	8x7=____	5x7=____	6x7=____	3x7=____	(195)
Total digits (26)	(53)	(79)	(108)	(137)	(167)	(195)	

Practice Exercise 11

From the following skill statement, specify the standard of performance the student must meet to show mastery of the skill.

Given division problems with quotients less than 50 and no remainders in the form 4/84, student writes the quotient for each.

Samples test items:

Standard of performance: ______________________

____

____

____

Your answer should include at least 15 problems, randomly choosing number combinations which meet the criteria of quotients less than 50.

The standard of performance should include the following: time limit for completion of the problems, and the percentage of accuracy necessary.

Practice Exercise 12

From the following skill statement, write a test item and specify the standard of performance the student must meet to show mastery of the skill. (Use multiple choice format.)

Given four choices, student circles the human organ whose function is described.

Test item: ______________________

____

____

____

____

Standard of performance: ______________________

____

Your answer for the test item should include a stem (the question), the correct answer and three distractors (incorrect but possible choices). The standard of performance should include the following: the percent of accuracy necessary, and the time limit allowed for completion of the question.

When you have finished writing your test, evaluate it. Determine whether the test measures those skills you intended to measure. Once you have used your test, if you find areas that do not measure what you thought they did, poor test items, poor sampling, etc., change those sections of the test to meet the needs prior to using the test again. The test should be revised whenever flaws appear as it is being used.

Assignment 10

Directions

1. **Using your Instructional Planning Sheet, determine which responses are motor or oral and which responses are written.**
2. **For motor or oral responses, specify the conditions for assessing student responses.**
3. **For written responses, construct the actual material to be used for assessing the skill.**

Criteria

1. **Each student response is correctly identified as a motor or oral response or as a written response.**
2. **Conditions or materials are specified or constructed.**
3. **Descriptions of conditions for observing motor or oral responses and copies of materials constructed for assessing written responses are submitted.**

A FILING SYSTEM

It is now important to set up a filing system for the storage of assessment materials and supplemental materials designed for use with the sequence specified in the Instructional Plan. The first step in setting up a filing system is to organize the materials you wish to file in a sequence. For arithmetic this sequence may be used: addition, subtraction, multiplication, division, fractions, percentages, etc. Within each broad area, the materials should also be arranged in sequence. For the area of addition, the sequence might be addition facts, addition problems without carrying, and addition problems with carrying.

Once you have sequenced your assessment and supplemental materials, they should be arranged in a filing system. Each major heading like addition or subtraction should have a separate divider. This divider should clearly differentiate each major area. The materials within each major area should be in separate folders in the sequence you determined. The labels for each folder should be specific enough that you can identify the contents of the folder from the label.

The skills identified on the Instructional Planning sheet and the skills assessed in your criterion referenced test are related to a total instructional assessment program. Initial assessment, using the criterion referenced test, indicates where a student should be placed in the instructional sequence. The instructor then teaches the skill(s) to the student. The instructional process continues as the student masters the skills. At the same time, the assessment process provides the data for determining when the student has mastered a skill. To facilitate the management of this continual instructional-assessment process, a class progress chart can be constructed. This chart condenses student placement and progress for efficient access to specific details.

The following reading skills are the objectives of the teacher in decoding:

1. Orally reading sounds
2. Blending sounds (regular words)
3. Blending sounds (nonsense words)
4. Orally reading irregular words
5. Orally reading randomly presented words
6. Orally reading sentences
7. Orally reading paragraphs.

An example of a class progress chart used for recording student performance appears on page 54.

Here are the directions for making your own class progress chart.

1. On a piece of 8½" x 11" paper, mark off squares, leaving approximately 1½" at the left for student names.
2. In the left hand column, list each student's name in alphabetical order.
3. Make several copies of the chart from this original.
4. Across the top of one of the copies of the chart, list your objectives and/or numbers which correspond with a particular set of objectives in sequential order (from simplest to most complex).
5. Write in the date on which the student met criteria on a particular objective in the square.
6. As the student completes each step in the sequence by meeting the performance criteria, write the date of completion in the corresponding square by the student's name.

Assignment 11

Directions

1. **Make a class progress chart for the unit of instruction you tested (Assignment 1).**
2. **Write in the date of completion for the skills each student has mastered.**

Criteria

a. **Student names are listed in alphabetical order on the left.**
b. **Skills are listed across the top of the chart.**
c. **Dates are used to indicate student mastery of skills.**

NAME	Orally reading sounds	Blending sounds (regular words)	Blending sounds (nonsense words)	Orally reading irregular words	Orally reading words	Orally reading words in sentences	Orally reading words in paragraphs						
Baxter, Sue	9/8	9/8	9/8	9/15									
Conrad, Steve	9/8	9/12	9/14										
Drake, Cindy	9/8	9/11	9/13	9/20									
Duke, John													
Eagan, Roger	9/8	9/8	9/8	9/8	9/8	9/8	9/13						
Echran, Carl	9/8	9/8	9/8	9/8	9/11	9/11							

Note: Students were tested for placement on September 8. As they met criteria for additional skills, the date of mastery was recorded. The last date recorded was September 20. This is *not* used for recording daily assignment work, only student mastery of specified skills.

SUMMARY

You will need to refer back to the class project chart to notice that one student, John, has not mastered any of the skills listed on the chart. How does a teacher manage the instruction of 30 students when this situation occurs? Should the entire class move on to a new set of skills? Should the entire class wait for John to catch up? Or should John be placed in an instructional situation where he can learn the desired skills?

The view of individualized instruction presented in this unit is that a program should be developed for John. If he does not master the skills at this point, it will be impossible for him to master more complex skills which require the student to use these prerequisite skills.

For the individual student who has difficulty mastering the skills presented in the classroom, the following procedure should be followed:

1. Break the skill into smaller instructional steps using the information presented previously.
2. Test the student on the first skill from the sequence you just developed.
3. Continue to test the student on these "smaller" steps until he or she has mastered each step, providing instruction and practice on those steps the student has not mastered.
4. When the entire skill (all the steps) is mastered, move on to the next skill.

John has not mastered saying the sounds for the letter symbols. To break this down into smaller steps, list all the letter symbols John should be able to identify with correct sounds. Test John to determine the exact sounds John knows by presenting each sound individually. On a chart which lists the skill John is working on (saying sounds), fill in the date of testing for those sounds John already knows. Then begin instruction and practice on the sounds he does not yet know. Test daily to determine mastery of new sounds and record the mastery of a new sound as soon as John meets the specified criteria. Remember: even at this level you will need minimum performance criteria to determine mastery.

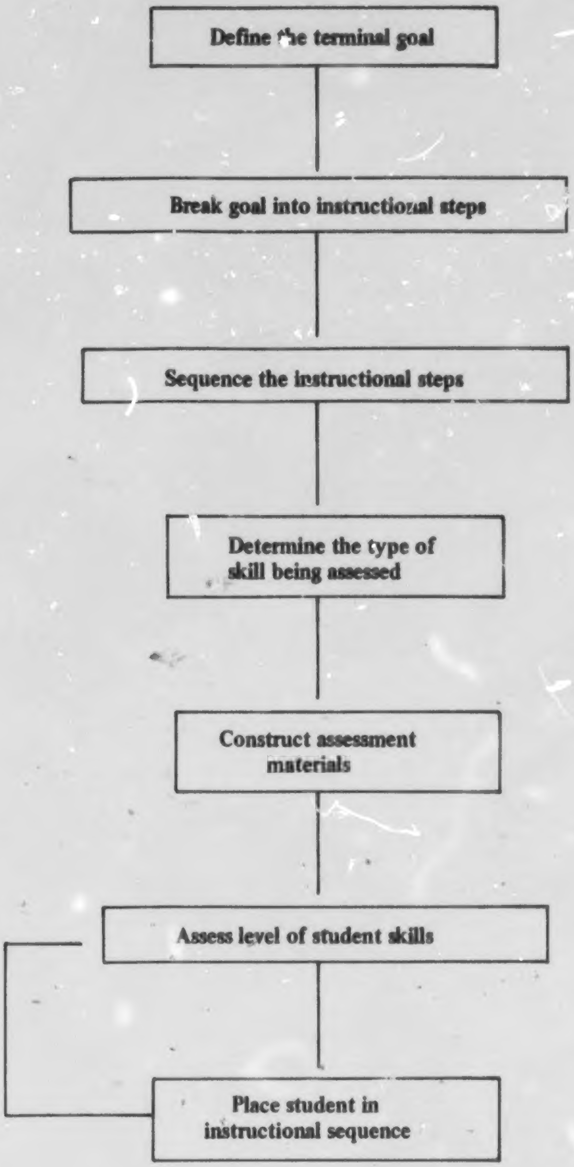
The chart for John may look like this:

	m	$\bar{a}$	l	s	t	
John	9/11	9/11	9/11	9/15		

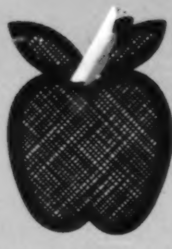
He has met the criteria on the first four sounds and is now working on "t." When he meets criteria on "t," the date will be filled in and the next sound he is working on added to the matrix. When a skill is broken into small enough steps, it becomes almost self-instructional. With a minimal amount of teacher direction, the student can practice the skill. The teacher then can quickly test the student for mastery. At the same time, the teacher can be instructing other students in the classroom in the skills on which they are working.

Then using the Instructional Plan, you should attend to two important concerns. The first is the adaptation of the Instructional Plan to meet individual student needs as shown in the preceding example. Most skills can be broken into smaller sequences of steps; the degree to which you break skills down is dependent upon the needs of the individual student. The second concern is the need to evaluate the effectiveness of the Instructional Plan. If steps are out of sequence or omitted, they should be corrected. The actual implementation of the Instructional Plan is the most efficient way to check this.

This instructional-assessment process can be applied to any area. The model at right outlines the steps to follow.


Define the terminal goal
Break goal into instructional steps
Sequence the instructional steps
Determine the type of skill being assessed
Construct assessment materials
Assess level of student skills
Place student in instructional sequence

The steps outlined in the preceding graph provide the basis for sequencing and assessing skills a student must master for any particular subject area.



Classroom Management Techniques for Individualizing Instruction

INTRODUCTION

In this course, you have looked at student behavior, the measurement of behavior, reinforcement systems, instructional planning, and assessment procedures and criteria for mastery of skills. The end objective of the total of all of these steps in a classroom is individualized instruction. One of the biggest and seemingly insurmountable concerns at this point is: "How do I do it with a class of 25, 30, or even 40 students?" The following description of a systematic procedure for organizing a management system for a classroom can help you manage a whole class in an individualized program.

RATIONALE

Individualized instruction, as presented in this course, is the testing, placement, and instruction of each student in a sequence of instructional objectives. Every student works through the same objectives, but does not spend the same amount of time on each task; if the student has already acquired the skill, he or she does not have to sit through group instruction. The instruction a particular student receives and its pace are designed to meet specific needs. This requires that each student be taught on an individual basis.

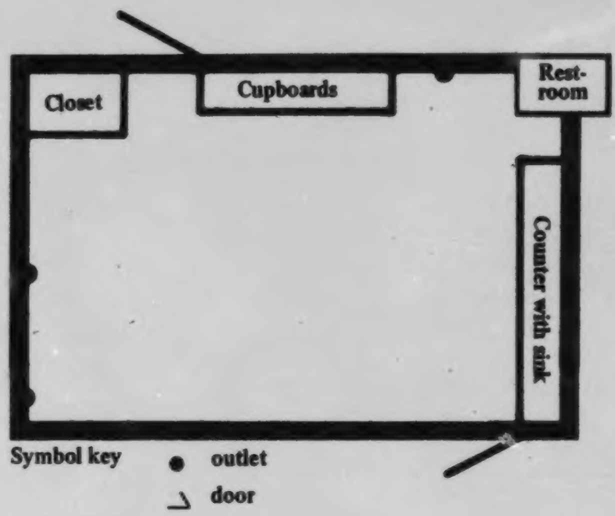
At some points in the instruction of the students, more than one student will be working on the same task at the same time. It is more efficient for you to teach the skill to all of them together. However, they may not be together the following day. The rule to follow is: if more than one student requires instruction in the same task on the same day, instruct all who need it together. Otherwise, instruct each student in the skill that the student is presently learning.

To provide this type of instruction for each student, the classroom must be managed in the most efficient manner possible to allow a maximum of instructional time for the teacher. Classroom management, then, is one of the critical features of an individualized program.

CLASSROOM ARRANGEMENT

Mrs. Jones has individualized instruction in her classroom. She has arranged her classroom so that she can reach each child quickly from any point in the classroom. She can utilize any equipment in her room efficiently, and she has maximized the use of storage area.

Mrs. Jones carefully planned the organization of her room. First she drew a map of her classroom, using a scale which gave her a rough equivalent of the actual room dimensions. She sketched in any object (bathroom, closet, outlets, etc.) that was in a permanent position in the classroom (i.e. objects that could not be moved even if she wanted). Next, she designated the use she makes of each of these immovable fixtures. The room arrangement which she eventually decided on was dependent upon this. An example follows:



After she located all the electrical outlets, she specified any uses she currently had for each of the outlets. She referred to the list of uses when she made decisions about room arrangement.

The model above shows that the teacher has some built-in counter space as well as a closet and some cupboards. The restroom adjoins the classroom next door. The counter, closet, and cupboard space are organized for maximum storage of materials so students can be as self-sufficient as possible. Next, Mrs. Jones made a list of all the materials which needed to be stored in the classroom. The list included items like:

stopwatches
textbooks
dittos
cassette players
bulletin board displays
paper
art supplies
science equipment
sports equipment
student records

She has organized the storage space so the materials that the children never come into contact with are near the top and/or near the back. This included unused textbooks, bulletin board displays, and seasonal decorations. Some of the materials that are used by the students, but are not necessary for instruction or practice on a daily basis, are easily reached by the students, but they are not in the most accessible places. The most accessible storage areas are used for storing instructional programs that the students frequently use and which they can retrieve themselves. This includes books, dittoed material, cassette players, and sports equipment.

Whenever a space becomes designated for a specific use, Mrs. Jones informs all the students in her classroom, so they are familiar with the location of the materials and equipment with a minimum of repetition of directions. Once areas have been designated for particular uses, she avoids unnecessary confusion by using the area only for its designated use.

The furniture, including the teacher's desk, is arranged in such a manner that every student can be reached by the teacher from any other point in the room without interfering with the work of any other student. The teacher has immediate access to every child. She has arranged this by placing the desks separate from one another. When arranging the furniture, Mrs. Jones kept in mind the traffic patterns that are necessary for students to have easy access to their materials, folders, and equipment.

Examples of floor plans which Mrs. Jones could use with the furniture are on page 58.

As you can see from the examples, there are several ways a classroom could be arranged efficiently. The floor plan should meet the needs imposed by the teacher's instructional program, remaining flexible and accessible to both students and teacher.

DAILY ASSIGNMENT FOLDERS

Individualized instruction can only occur when students are not dependent upon the teacher for every assignment. Instead of announcing each assignment to the class and then attending to individual variations, questions, and instructions, Mrs. Jones has developed a management system whereby each student, upon commencement of class, knows his or her exact assignment for that time block.

Each student is provided with a folder. A sheet is attached to the folder which tells the student where to begin and what work to do during that particular class. The inside of the folder contains any work the student is assigned, the record keeping sheet (graph) for that task, and the answer key. (The answer key may be kept at a central location if you do not have a large enough supply for every child in your classroom.)

The Daily Assignment Sheet should be as explicit as possible in telling the student what he or she must do for the day. The simplest way to do this is to list the activities required of students in the various subject areas and simply check off those required on each day. The checking off may be in terms of the amount of time to be spent on each activity or the number of repetitions, number of questions, or amount of reading to be performed. An example of a Daily Assignment Sheet with assignment specified follows on page 59.

The Daily Assignment Sheet for Randy Smith shows that for February 2, Randy has the following assignments: in reading he is to practice reading sounds orally 20 times; read pages 28 to 32 (in reading book) silently; read orally from page 30 (indicating to the teacher when he is ready); answer the questions on page 33, and read the vocabulary words on page 28.

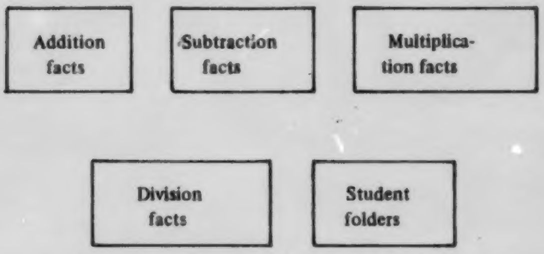
This is an example of a Daily Assignment Sheet for one student. The assignments are only examples of what might be required for one day. You may add or delete from these. The important point is that if the assignments are listed in this manner, the work required to specify individual assignments for each day is minimal. The student's performance today will tell you whether he or she needs the same or different assignments for tomorrow.

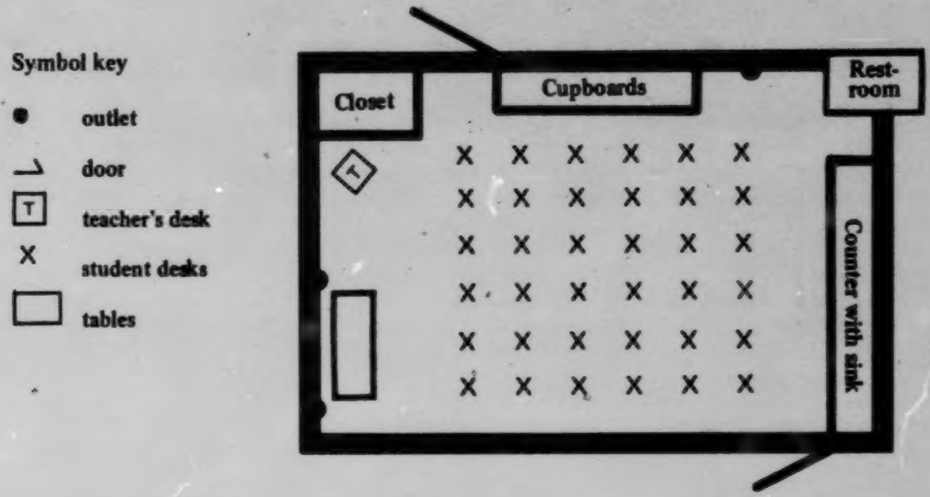
The use of the assignment sheet for arithmetic and spelling is also illustrated on page 59. A blank Daily Assignment Sheet for you to duplicate and use is included at the end of the unit.

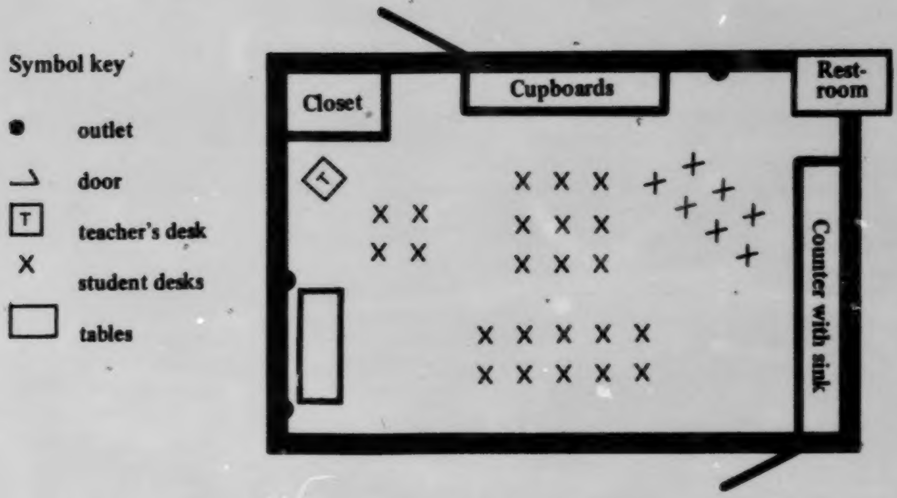
As the student enters the class, he or she picks up the folder and proceeds to desk or work area. He or she begins on the assignments which are recorded on the front of the folder. The folder may contain the material for the assignment, the answer key, and the record sheet (graph or chart). Examples of the contents of an assignment folder are located at the end of the unit on pages 63 to 66. A rate table is also included in the assignment folder if the timed sample is for a time other than one minute.

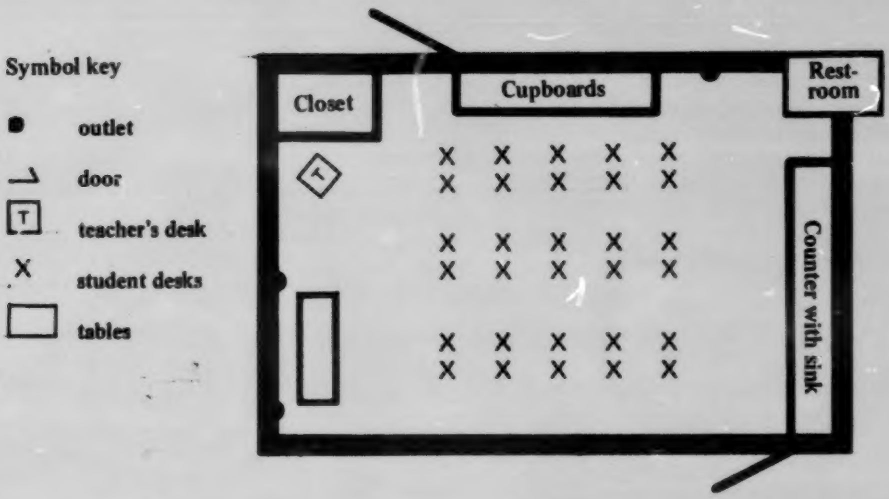
To avoid unnecessary practice of skills which the student has already mastered, Mrs. Jones begins each class period with a simple five-minute test or timing. An example of this is the way she has individualized work on arithmetic combinations. Some of her students are working on addition facts, others subtraction and multiplication, and a few are on division facts. She times her entire class on the math facts contained in each individual folder. Each student corrects his or her own paper and records the data. Mrs. Jones monitors the corrections and recordings. If the student has met criteria, he or she obtains the next page (assignment) of the series and begins work on it. If the student has not met criteria, he or she works on the same page. This procedure of timing an entire class takes five minutes or less. One minute is allowed for the actual timing; four minutes are allowed for getting the folders, correcting papers, recording data, and obtaining new assignment pages.

To facilitate student management, all materials are easily accessible. Mrs. Jones has boxes arranged on a counter as follows:




Symbol key
● outlet
door
T teacher's desk
X student desks
tables
Closet
Cupboards
Rest-room
T
Counter with sink


Symbol key
● outlet
door
T teacher's desk
X student desks
tables
Closet
Cupboards
Rest-room
T
Counter with sink


Symbol key
● outlet
door
T teacher's desk
X student desks
tables
Closet
Cupboards
Rest-room
T
Counter with sink

(For tutoring situations especially)

Name Randy Smith

SAMPLE DAILY ASSIGNMENT SHEET

			Reading								Arithmetic							Spelling								
Mo	Day	Yr	Oral sounds—# of times	Silent reading—page	Oral reading—page	Answer questions—page	Vocabulary words—page				Fact drill—minute	Story problems—page	Timed drill—page	New skill—yes-no				Word list—page	Write words—# times	Write sentences—yes-no	Test-individual—yes-no	Test-class—yes-no				
2	2	76	20	28 to 32	30	33	28				5	49	34a	NO				40	5	YES	YES	NO				

To avoid student lines and scuffling when working with an entire class, Mrs. Jones has divided the student folders into four equal groups alphabetically. Each group of folders is placed in a different area of the classroom. Students can then get their folders quickly and do not have to wait in a long line. Another possibility would be to divide the class into groups. Each group has a leader who gets the folders for all members of the group and distributes them. When the students are finished with their work, they return their folder to the group leader who is responsible for storing them.

Individualized instruction requires skillful management of both the physical environment of the classroom and instructional time. There are some specific points to remember.

1. Students can manage the majority of their needs in the classroom.
2. Other people, students, and adults can be trained to help monitor the progress of the students in the classroom.
3. The arrangement of the physical setting of the classroom can facilitate flexible traffic patterns.

Assignment 12

Directions

1. **Make an assignment folder for arithmetic drill facts for five students in your class. This may be for addition, subtraction, multiplication, or division facts.**
2. **Turn in a copy of one folder after the assignments for at least five days have been recorded.**

Criteria

- a. **An assignment page is attached to the folder.**
- b. **The folder includes the assignments, record keeping measures, and possibly an answer key.**

DAILY ROUTINE CHART

Mrs. Jones has individualized several subject areas. Although the activities the students work on have become more diverse, daily planning and monitoring of the students is not complex. Mrs. Jones uses a scheduling chart to assist in planning each student's activities throughout the day. By referring to the chart Mrs. Jones knows what each student is doing and where each student is throughout the day. She can also check the chart to see if she is utilizing instructional time in the most efficient manner.

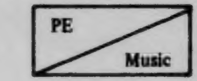
This daily plan chart is set up similar to the class progress chart used in the criterion referenced unit. The students' names are listed down the left side of the chart. Time blocks are listed across the top of the chart. Blocks of half hours are most easily used unless the activities of the students in your classroom change frequently at 15-minute intervals. If so, the more frequent time block should be used. Once the chart is completed, each time block for each student is filled in according to his or her daily schedule. Every student activity is included (PE, music, science, etc.). An example follows:

Name	Time 8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	1:00	1:30	2:00
Blake, Sue												
Brown, Jon												
Carlson, Peter												
Cedar, Cathy												
Cranston, Ron												

Mrs. Jones is as specific as possible in filling in each block of time. If the student is working in addition on a long term unit, she lists

Math: addition

in the box. Sometimes it is necessary to code the chart for alternating schedules. If physical education (PE) and music are taught in the same time block on alternate days, the block would look like this:



It may be more convenient to have a chart for each day of the week. Also, the student's activities are specified for those times when instruction occurs outside the classroom (instrumental music, remedial reading, speech). The chart is kept as up-to-date as possible.

Assignment 13

Directions

1. **On a large piece of paper, make a chart for your daily class routine.**
2. **Place the name of each student on the left side of the chart.**
3. **Fill in the time blocks you desire across the top of the chart. (It is recommended that these be no more than 30 minutes, but may be the time schedule your class operates on.)**
4. **Fill in the schedule, indicating as specifically as possible what each student does during every time block of the school day. If every student has the same activity, such as PE, at the same time, draw a line with an arrow across the time blocks and write the activity in only once.**

Criteria

a. **All student names are listed on the left in alphabetical order.**
b. **Specific time blocks are listed on the top of the chart.**
c. **Every block is filled in for each student.**

TUTORS

Mrs. Jones has found the use of extra personnel (tutors) an invaluable aid in the management of her classroom. Generally, tutors in a classroom come from two main sources, either aides who are paid by the school district or volunteers from within the school or community. Mrs. Jones relies on the help of the tutor to instruct students in the specific skills he or she is working on during a particular block of time. The information that follows applies to the selection and training of any tutor.

Selection of Tutors

There are several sources of volunteer help in most communities. It is usually better to solicit volunteers rather than request specific people to come into the classroom to help the teacher. Usually the volunteer wants to be there, while the requested individual may feel an obligation to accept your request. The following sources of volunteers are prioritized on the basis of their general availability and reliability; it will be most efficient for you to draw from the groups with asterisks (*).

*1. Students in your school or nearby school (even within your own classroom),
*2. Students from nearby colleges and junior colleges,
3. Community service groups,
4. PTA organizations,
5. Volunteer organizations,
6. Church groups, and
7. Senior citizen groups.

Students from within your school are available to you during the same hours you are teaching. They are nearby in the school and attendance can be monitored merely by checking with the tutor's homeroom teacher. Students from other schools may be equally as reliable, especially if they are receiving school credit for their volunteer time.

Prerequisites for Tutoring

Reliability. The tutor must be reliable. No matter how the tutor's time is scheduled (i.e., every day, once a week, etc.), the teacher must have some assurance that the tutors will be there when they say they will be; otherwise, the teacher cannot plan a specific program for any tutor to carry out.

Health. The tutor must be in good enough health so that it does not interfere with scheduled volunteer times. Two other considerations are vision and hearing.

Transportation. A third prerequisite is that the person must have adequate transportation worked out for each of their scheduled volunteer times. This is not a problem for in-school tutors.

Skills

Reading. The tutor can read orally at least one grade level above the child being tutored. Other specific skills are saying sounds, blending, and reading words. It is important for the tutor to demonstrate each skill he or she will be teaching.

Arithmetic. The tutor can add, subtract, multiply, and divide multiple digit problems, including carrying and borrowing.

Speech. The tutor speaks clearly, enunciating words, and using culturally correct vocabulary in the classroom.

Following Directions. The tutor can follow directions given by the teacher when tutoring a student. This may include carrying out a specific program, correction of papers, recording of data, and reinforcing the pupil being tutored.

Other skills that would help a tutor in the classroom are the ability to follow oral and written directions, and the acceptance of both praise and constructive criticism of their work with the students. The latter, particularly, can avoid misunderstandings.

Training Tutors

Determining Prerequisite Skills. In order to determine if the tutor has the skill that he or she must teach, the teacher should ask the tutor to demonstrate it. If the tutor meets the criteria, he or she can teach it. If not, assign the tutor to another task and find another tutor. Next, the teacher should assume the role of a student and have the tutor perform the task he or she must do with a student. Some tutors may be able to read orally, but not be able to listen to another person's oral reading critically enough to tutor in reading. Be sure the tutor can monitor the skill as well as perform it.

Training Program. Tutors and aides must be trained in the procedures and rules of the classroom, as well as their own specific duties. If possible, the tutors should be trained in a group to avoid unnecessary repetitions of the same directions. First, general procedures should be covered. These include:

1. The daily class routine,
2. The expected conduct, and, if necessary, attire of the tutor, and
3. Brief instruction in measurement, reinforcement, and their relationship.

Following this, the tutors should be divided into groups according to the skills they will be tutoring. In most cases this will involve a group for reading and a group for arithmetic. Each group should be trained in the following, applied specifically to reading or arithmetic:

1. Presentation of material to the student,
2. The response necessary from the student,
3. Specific procedures for measuring each required student response,
4. Correction procedures,
5. Procedures for recording data,
6. The reinforcement system used in the classroom,
7. Additional information to communicate to the teacher,
8. Criteria for mastery of skills, and
9. Assignment to specific children.

It may be necessary to repeat one or both of the groups if some tutors are working in more than just one area. As much of the training rules and directions as possible should be in written form so the tutor can refer to them. The teacher can also refer the tutor to the written material when he or she is asking questions on basic procedures. A rule of thumb to follow is–if you have to say anything *twice*, write it down.

Once the tutor(s) is selected and trained, the teacher should provide a means for keeping records to efficiently manage the progress of the student and the tutor and maintain appropriate educational programs. The record keeping system has two major parts. First, the tutor should be instructed in recording daily data from the performance of the student. This is usually kept on a graph. The second part is a continuous record of the program the student is in, the part of the program he or she has completed, and the noting each day of the completion of the prescribed work. From this information, the teacher can continually assess the progress of the student and keep the student and tutor on task.

Monitoring Tutors

Direct Observation. The performance of the tutor can be monitored *directly* by *observing* the tutor as he or she works with the student. Pay particular attention to the tutor's presentation of the task, measurement of the student response, recording of data, and reinforcement of the pupil.

Indirect Observation. *Indirect observations* of the tutor include evaluating the recorded data, determining pupil progress through the sequence of instructional objectives (recorded on the Class Progress Chart), and tutor attendance.

Reinforcement of Tutors. Tutors and aides, just as the teacher and classroom students, need to be *reinforced* systematically for their work with the students. Some suggested activities follow. First, the teacher, either verbally or in writing, should tell the tutor of the positive progress his or her particular student(s) is making. This can be done in a sentence or two or by showing the actual progress through looking at data that has been recorded on graphs and/or charts. The second step is for the teacher to sponsor a social event for the tutors and perhaps their students at least once a quarter as a thank you for their efforts. Thirdly, at an assembly or social event, the teacher can pass out certificates of service to the tutors, signed by the teacher and the principal. The teacher should schedule each of the events, so the reinforcement is done systematically.

STUDENT MANAGEMENT

Mrs. Jones has also found that the children in her classroom can become responsible for much of the paperwork, materials, and indirect maintenance of the organization of the classroom. In fact, the children have become responsible for the majority of their needs in the room. She has trained students to take attendance and lunch count. The training procedure Mrs. Jones used was to have a student fill out the attendance record and another student take the lunch and milk count. She double checked the figures the first two or three days. She then had the student train other students, so that they could assume these responsibilities in case of absences. This management system has freed about 10 minutes of Mrs. Jones' time each morning which can now be devoted to individualized instruction or a related activity. Some examples of other responsibilities which Mrs. Jones has assigned to herself and to her students follow:

Teacher Responsibilities

1. Monitors the timing that is recorded.
2. Determines mastery criteria.
3. Selects and adapts material.
4. Teaches new skills

Student Responsibilities

1. Gets his or her own material and file folder.
2. Practices assignments alone or with partner.
3. Listens to other students practice.
4. Records his or her rate or score.
5. Puts away his or her material and file folder.

Assignment 14

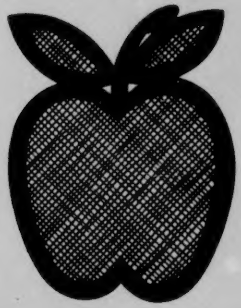
Directions

1. **Select a student who can tutor in your classroom. This may be a student from your school or a nearby school, or one who is currently working in your classroom.**
2. **Train the tutor, following the established guidelines.**

Criteria

a. **The training program is specified.**
b. **A copy of the written guidelines for the tutor is included. This may be a contract.**

SAMPLE CONTENTS OF DAILY ASSIGNMENT FOLDER



DAILY ASSIGNMENT SHEET FORM

Name________________________________

Mo	Day	Yr																	

SAMPLE MULTIPLICATION TEST

Name____________________ Date______________ Correct________ Errors________ Rate______

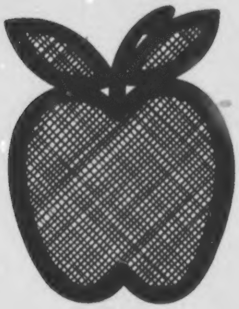
							Total digits
1x7=____	8x7=____	1x7=____	10x7=____	1x7=____	7x7=____	0x7=____	(10)
9x7=____	7x7=____	0x7=____	10x7=____	10x7=____	7x7=____	5x7=____	(23)
10x7=____	9x7=____	3x7=____	6x7=____	9x7=____	5x7=____	9x7=____	(37)
4x7=____	2x7=____	5x7=____	1x7=____	4x7=____	10x7=____	6x7=____	(50)
0x7=____	7x7=____	10x7=____	8x7=____	9x7=____	4x7=____	5x7=____	(63)
5x7=____	2x7=____	2x7=____	6x7=____	7x7=____	10x7=____	7x7=____	(77)
3x7=____	10x7=____	3x7=____	4x7=____	8x7=____	8x7=____	7x7=____	(91)
3x7=____	1x7=____	4x7=____	2x7=____	5x7=____	8x7=____	3x7=____	(104)
1x7=____	6x7=____	0x7=____	10x7=____	3x7=____	2x7=____	1x7=____	(115)
2x7=____	2x7=____	0x7=____	2x7=____	6x7=____	9x7=____	10x7=____	(128)
6x7=____	4x7=____	4x7=____	5x7=____	6x7=____	3x7=____	7x7=____	(142)
8x7=____	0x7=____	10x7=____	8x7=____	10x7=____	9x7=____	8x7=____	(155)
7x7=____	10x7=____	6x7=____	3x7=____	2x7=____	10x7=____	4x7=____	(169)
9x7=____	1x7=____	6x7=____	7x7=____	8x7=____	7x7=____	3x7=____	(182)
1x7=____	10x7=____	10x7=____	8x7=____	5x7=____	6x7=____	3x7=____	(195)
Total digits (26)	(53)	(79)	(108)	(137)	(167)	(195)	

SAMPLE MULTIPLICATION TEST (Answer Key)

Name________________________ Date________________ Correct________ Errors________ Rate______

							Total digits
1x7= 7	8x7= 56	1x7= 7	10x7= 70	1x7= 7	7x7= 49	0x7= 0	(10)
9x7= 63	7x7= 49	0x7= 0	10x7= 70	10x7= 70	7x7= 49	5x7= 35	(23)
10x7= 70	9x7= 63	3x7= 21	6x7= 42	9x7= 63	5x7= 35	9x7= 63	(37)
4x7= 28	2x7= 14	5x7= 35	1x7= 7	4x7= 28	10x7= 70	6x7= 42	(50)
0x7= 0	7x7= 49	10x7= 70	8x7= 56	9x7= 63	4x7= 28	5x7= 35	(63)
5x7= 35	2x7= 14	2x7= 14	6x7= 42	7x7= 49	10x7= 70	7x7= 49	(77)
3x7= 21	10x7= 70	3x7= 21	4x7= 28	8x7= 56	8x7= 56	7x7= 49	(91)
3x7= 21	1x7= 7	4x7= 28	2x7= 14	5x7= 35	8x7= 56	3x7= 21	(104)
1x7= 7	6x7= 42	0x7= 0	10x7= 70	3x7= 21	2x7= 14	1x7= 7	(115)
2x7= 14	2x7= 14	0x7= 0	2x7= 14	6x7= 42	9x7= 63	10x7= 70	(128)
6x7= 42	4x7= 28	4x7= 28	5x7= 35	6x7= 42	3x7= 21	7x7= 49	(142)
8x7= 56	0x7= 0	10x7= 70	8x7= 56	10x7= 70	9x7= 63	8x7= 56	(155)
7x7= 49	10x7= 70	6x7= 42	3x7= 21	2x7= 14	10x7= 70	4x7= 28	(169)
9x7= 63	1x7= 7	6x7= 42	7x7= 49	8x7= 56	7x7= 49	3x7= 21	(182)
1x7= 7	10x7= 70	10x7= 70	8x7= 56	5x7= 35	6x7= 42	3x7= 21	(195)
Total digits (26)	(53)	(79)	(108)	(137)	(167)	(195)	

ASSIGNMENT SHEETS



Name:

Address:

Date:

Assignments 1-4: Turn in a copy of the completed Instructional Planning Sheet. The "Subtopic," "Skill Statement," and "Assessment" columns should all be completed. (Send in with Assignment 5.)

Name:

Address:

Date:

Assignment 5: Send in the materials or copies of the materials constructed for the skills assessed in the Instructional Plan. (Send with Assignments 1-4.)

Name:

Address:

Date:

Assignment 6: Attach a copy of the Class Progress Chart for the Instructional Plan.

Name:

Address:

Date:

Classroom Management

Assignment 7: Turn in a copy of a folder designed for arithmetic drill facts. Include the assignments, correction procedures, and record keeping measures. Attach the folder to this sheet.

Name:

Address:

Date:

Classroom Management

Assignment 8: Send in a copy of your completed Daily Schedule Matrix. Attach it to this sheet.

Name:

Address:

Date:

Classroom Management

Assignment 9: Attach the handbook or contract describing training procedures and guidelines for tutors to this sheet of paper. Describe the program your trained tutor is following on this sheet.

Tutor:

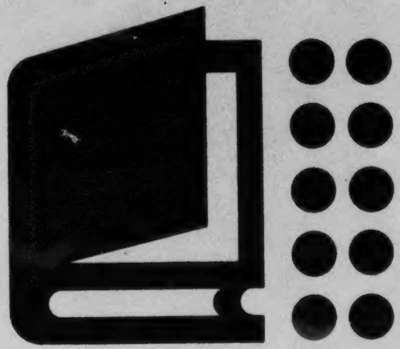
Age:

Program:

INSTRUCTIONAL MATERIALS:

How to Analyze, Adapt, Select, and Develop

UTAH STATE UNIVERSITY
LOGAN, UTAH 84322



INSTRUCTIONAL MATERIALS:
How to Analyze, Adapt, Select, and Develop

This material was prepared under
BEH Contract OEC-0-74-9327
Hyrum S. Henderson
Principal Investigator

Contributors to the product were
Terry Rovig
Tina Rosen
Hyrum S. Henderson

Instructional Material for Special Education 640
UTAH STATE UNIVERSITY
Logan, Utah 84322

Copyright © 1976
Utah State University Press

Contents

COMPONENTS FOR INSTRUCTIONAL MATERIALS COURSE, SPECIAL EDUCATION 640 5

PROCEDURES FOR COMPLETING INSTRUCTIONAL MATERIALS COURSE, SPECIAL EDUCATION 640 6

INTRODUCTION 7
- Primary Emphasis of the Course 7

ANALYZING AND ADAPTING READING MATERIALS 8
- Instructional Planning Sheet 8
- Procedures for Analyzing and Adapting Reading Materials 8
- Critical Elements 8
  - Response 10
  - Stimulus 10
  - Assessment 10
  - Practice 10
- Instructional Examples 10
  - Material A 10
  - Material B 11
  - Material C 11
- Instructional Examples–Blending 12
  - Material D 12
  - Material E 13
  - Material F 13
  - Summary 13
- Adapting Instructional Materials 14
- Adding and Deleting Instructional Materials . . . 14
- Problems and Suggestions 14
- Instructional Procedures 16
- Management of Instructional Materials 16
  1. Design Record Keeping Procedures . 17
  2. Specify Storage and Retrieval of Material and Records 17
  3. Specify the Responsibilities of the Teacher and Students . . . 17

ANALYZING AND ADAPTING MATHEMATICS MATERIALS 19
- Instructional Planning Sheet 19
- Procedures for Analyzing and Adapting Mathematics Materials 19
- Critical Elements 19
  - Response 19
  - Stimulus 19
  - Assessment 37
  - Practice 37
- Initial Instruction 37
  - Material A–Number Recognition 37
  - Material B–Number Recognition 38
  - Material C–Addition 39
  - Material D–Addition 39
  - Material E–Subtraction 40
  - Material F–Subtraction 41
- Summary 42
- Practice Materials 42
  - Mastery of Basic Math Skills 42
- Critical Elements 42
  - Response 43
  - Stimulus 43
  - Assessment 43
  - Practice 43
- Instructional Examples 43
  - Material G–Addition 43
  - Material H–Addition 44
- Establishing Minimum Performances 46

SELECTING INSTRUCTIONAL MATERIALS 49
- Selection Procedure 49
- Formal Screening Procedures 49

DEVELOPING INSTRUCTIONAL MATERIALS . . . 52
- When to Develop 52
- Steps in Developing Instructional Materials 52
- Procedures for Developing Instructional Materials 52
- Explanation of Steps in Materials Development 52
  1. Select the Subject Area 52
  2. Specify the Range of Skills to be Covered 52
  3. Construct or Obtain Instructional Materials for Each Step 52
  4. Develop a Management System . . . 52
  5. Try Out the Program 52
  6. Keep Track of Pupil Performance on Each Step 53
  7. Revise the Program at Points of Difficulty 53
  8. Try Out the Revised Program 53
  9. Have Other Teachers Try the Program 53
  10. Make Final Revisions if Necessary 53
- Some Important Points 53
- Summary 55

COVER SHEETS FOR ASSIGNMENTS 57

SAMPLE FORMS 77

Practice Exercises

Practice Exercise 1 . . . 10
Practice Exercise 2 . . . 11
Practice Exercise 3 . . . 11
Practice Exercise 4 . . . 12
Practice Exercise 5 . . . 12
Practice Exercise 6 . . . 13
Practice Exercise 7 . . . 13
Practice Exercise 8 . . . 16
Practice Exercise 9 . . . 17
Practice Exercise 10 . . . 38
Practice Exercise 11 . . . 38
Practice Exercise 12 . . . 39
Practice Exercise 13 . . . 40
Practice Exercise 14 . . . 41
Practice Exercise 15 . . . 42
Practice Exercise 16 . . . 43
Practice Exercise 17 . . . 44
Practice Exercise 18 . . . 44
Practice Exercise 19 . . . 49
Practice Exercise 20 . . . 50
Practice Exercise 21 . . . 53
Practice Exercise 22 . . . 53

Assignments

Assignment 1 . . . 14
Assignment 2 . . . 15
Assignment 3 . . . 15
Assignment 4 . . . 16
Assignment 5 . . . 17
Assignment 6 . . . 18
Assignment 7 . . . 18
Assignment 8 . . . 47
Assignment 9 . . . 48
Assignment 10 . . . 51
Assignment 11 . . . 55

Charts and Sample Pages

Instructional Planning Sheet (Reading–Decoding) . . . 9
Instructional Planning Sheet (Mathematics–Counting) . . . 20
Instructional Planning Sheet (Mathematics–Reading Numerals and Symbols) . . . 21
Instructional Planning Sheet (Mathematics–Writing Numerals and Symbols) . . . 22
Instructional Planning Sheet (Mathematics–Equality) . . . 23
Instructional Planning Sheet (Mathematics–Addition of Single Digit Numbers) . . . 24
Instructional Planning Sheet (Mathematics–Subtracting) . . . 25
Instructional Planning Sheet (Mathematics–Rote Counting) . . . 26
Instructional Planning Sheet (Mathematics–Reading Numerals and Symbols) . . . 27
Instructional Planning Sheet (Mathematics–Writing Numerals and Symbols) . . . 28
Instructional Planning Sheet (Mathematics–Place Value) . . . 29
Instructional Planning Sheet (Mathematics–Addition) . . . 30
Instructional Planning Sheet (Mathematics–Subtraction) . . . 31
Instructional Planning Sheet (Mathematics–Multiplication) . . . 32
Instructional Planning Sheet (Mathematics–Division) . . . 33
Instructional Planning Sheet (Mathematics–Counting) . . . 34
Instructional Planning Sheet (Mathematics–Writing Numerals) . . . 35
Instructional Planning Sheet (Mathematics–Place Value) . . . 36
Determining Rate and Accuracy . . . 45
Establishing Minimum Performances . . . 46
Measurement Chart . . . 54
Reading Mastery Placement Test Recording Form . . . 79
Analyzing and Adapting Instructional Materials . . . 81
Selecting Instructional Materials . . . 83
Study Guide for Reading Mastery . . . 85-89
Answer Key to Study Guide for Reading Mastery . . . 90-94

Components for Instructional Materials Course, Special Education 640

The following components are included with this unit of instruction.

1. **Instructional Materials Text**
   You are reading the Instructional Materials Text now.
2. **Instructional Planning Sheet for Reading**
   The Instructional Planning Sheet will be used as a reference for completing assignments. It is an example of a well written instructional plan for beginning reading.
3. **Instructional Planning Sheet for Mathematics**
   The Instructional Planning Sheet will be used as a reference for completing Assignments 7, 8, and 9. It is an example of a well written instructional plan for elementary mathematics. It is not, however, a totally complete plan.
4. **Response Forms for Analyzing and Adapting Instructional Materials**
   These response forms will be needed to complete the assignments for analyzing and adapting reading and mathematics materials in Chapters 1 and 2 of this text.
5. **Response Form for Selecting Instructional Materials**
   This form will be needed to complete the assignments in Chapter 3 of this text.
6. **Teacher's Manual for Reading Mastery***
   This is an excellent program for basic reading. It teaches decoding skills and states a criterion of both accuracy and rate for mastery.
7. **Study Guide for Reading Mastery**
   The study guide is designed to aid you in using the teacher's manual. It is included at the end of this text.
8. **Assignment Cover Sheets**
   These cover sheets will provide a method of keeping track of completed assignments. They are bound in at the end of the text. Remove each one as needed.

---

*The Reading Mastery Program © 1976 Mastery Programs Ltd. is not a part of BEH Contract OEC-0-74-9327. It may be obtained from Mastery Programs Ltd., P.O. Box 90, Logan, Utah 84321.

Procedures for Completing Instructional Materials Course, Special Education 640

The following steps are suggested for completing your work in this course of instruction. This outline may be used as a checklist.

____1. Read the introductory material on page 7 in preparation for your work on this unit.
____2. Study pages 8-14. Complete Assignments 1 and 2, pages 14-15. Complete Assignments 3 and 4, pages 15 and 16.
____3. Study pages 16 and 17. Complete Assignment 5, page 17.
____4. Study pages 16 and 17. Complete Assignment 6, page 18. Send in a copy of Assignment 6.
____5. Begin Assignment 7 as soon as materials from Assignment 6 are sent back.
____6. Read and study pages 19-46. Complete Assignments 8 and 9, pages 47 and 48.
____7. Read and study pages 49-51. Complete Assignment 10, page 51.
____8. Read and study pages 52-55. Complete Assignment 11 (optional), page 55.

You will get a clearer overview of the objectives for each unit and the interrelationship of the assignments if you first survey and read each unit, including assignments, in its entirety. Then, return to the beginning of the unit and follow the procedures outlined above for completing that part of the course.

Send your assignments to:

Utah State University
Independent Study Division
UMC 50
Logan, Utah 84322

Your assignments will be returned to you to (a) certify that you have completed, satisfactorily, your work on this course, or (b) indicate what needs to be done to complete your work satisfactorily.

Introduction

In the course, "Teaching Exceptional Children in the Regular Classroom," instruction was provided in:

1. The use of appropriate reinforcement in the classroom.
2. Instructional planning.
3. Criterion referenced testing.
4. Techniques for effective classroom management.

The skills a teacher acquires in that course make individualizing instruction a much simpler task. Individualized instruction makes it possible for the teacher to meet the academic needs of each student. The ability to carefully select and program instructional materials is also essential for individualizing instruction. In this course, you will be instructed in a systematic method for:

1. Evaluating instructional materials.
2. Adapting instructional materials.
3. Selecting instructional materials.
4. Developing instructional materials.

The focus of this course is the learner's behavior and those elements in the classroom teaching situation which are directly related to the learner's behavior. The stance of this course is:

> *Decisions for analyzing, adapting, selecting, and developing instructional materials should be directly related to the learner's behavior* (the instructional objectives).

Decisions concerning the appropriate and effective use of instructional materials should follow a specific procedure:

1. Decide what the learner must do to demonstrate that he or she has learned.
2. Decide what the teacher must do to get the student to emit the behaviors which demonstrate learning.
3. Select the instructional materials needed to accomplish the task (behaviors).

In the past, because of a lack of clear and explicit directions about "what to teach" and "how to teach," teachers were forced to rely solely on the available textbooks and workbooks. Local school districts and teacher training institutions frequently failed to offer direction in terms of program content and evaluation of student progress. This course provides solution strategies for teachers and administrators in material selection decisions.

Units in this course reflect a comprehensive view of the instructional materials evaluation-selection process. They include:

Unit 1–Analyzing and Adapting Reading Materials
Examine instructional materials by comparing their objectives with those listed on the Instructional Planning Sheet for Reading. On the basis of the examination-analysis, the necessary modifications or changes are made so that the materials will meet the objectives specified on the Instructional Planning Sheet.

Unit 2–Analyzing and Adapting Mathematics Materials
Examine instructional materials by comparing their objectives with those listed on the Instructional Planning Sheet for Mathematics. On the basis of the examination-analysis, the necessary modifications or changes are made so that the materials will meet the objectives specified on the Instructional Planning Sheet.

Unit 3–Selecting Instructional Materials
Selection decisions are made based upon the analysis and adaptations necessary and the estimated cost of making such adaptations.

Unit 4–Developing Instructional Materials
A procedure is discussed and a guideline is provided for developing instructional materials.

PRIMARY EMPHASIS OF THE COURSE

Throughout this course, materials and procedures used for teaching basic skills in reading and mathematics are emphasized. The rationale for this is that low performers, regardless of their grade level, are experiencing problems in acquiring new skills because they have not mastered prerequisite or basic skills. For this reason the skills which are analyzed on the Instructional Planning Sheets, the examples presented in the text of instructional materials, and the materials to be used for completing assignments are skills and materials which are taught and used in the primary grades (1-3).

Analyzing and Adapting Reading Materials

In 1967, Jeanne Chall completed an extensive five-year study concerned with critical analysis of existing research comparing different approaches to beginning reading instruction.

A summary of research evidence tells us the following about the relationship between initial teaching methods and learning to read.

1. A code emphasis–one that combines control of words on spelling regularity, presents some direct teaching of letter-sound correspondences, as well as the use of writing–produced better results with unselected groups of beginners than a meaning emphasis.
2. Clinical studies indicate that code emphasis helps children who are predisposed to reading and spelling difficulty.
3. Clinical studies indicate that children who are predisposed to reading and spelling difficulty need to use responses other than purely visual ones at the beginning stages of reading, and that the use of more oral, articulatory, and kinesthetic responses at the beginning does not prevent the child from becoming a normal reader later on.
4. There is reason to believe that normal children can become better readers–with classroom instruction that concentrates more on breaking the code than most current programs do.
5. A lack of interest in reading and in schoolwork is the result, not the cause, of reading difficulty.

The following instruction on analyzing and adapting reading materials reflects this research evidence. The purpose of this chapter is threefold:

1. To present a basic format for analyzing and adapting materials which may be used with any instructional program, on any grade level.
2. To provide instruction on evaluating beginning reading programs (in particular those programs which have a code emphasis).
3. To provide teachers, regardless of grade level, a method of teaching students with reading problems.

INSTRUCTIONAL PLANNING SHEET

The Instructional Planning Sheet for Reading is presented on the next page. This particular instructional planning sheet (or sequence of objectives) is presented for your use in analyzing instructional materials for teaching basic decoding skills. These subtopics are chosen because they are essential skills in learning to read and are included in some successful instructional programs. There are, no doubt, other skills that might be included.

It is not possible to analyze instructional materials in the absence of instructional objectives. On the Instructional Planning Sheet the objectives against which the materials must be analyzed are presented in a format that makes an analysis possible.

Since there is little agreement on the objectives to be included in teaching children to read, the Instructional Planning Sheet includes the essential skills needed for decoding only. There is ample evidence that mastery of these skills does develop good decoding ability.

The same procedure for analysis of instructional material could be followed for any set of objectives.

PROCEDURES FOR ANALYZING AND ADAPTING READING MATERIALS

In this section you will be taught how to analyze and adapt materials that have been designed to teach decoding or word attack skills. As you read through this unit, you will need each of the following:

Materials	Location
1. Instructional Planning Sheet for reading.	Page 9 of the text.
2. Response form for Analyzing and Adapting Instructional Materials.	Page 81 of the text.
3. Manual for Reading Mastery.	Included with this set of materials.
4. Set of student cards for Reading Mastery.	Included with this set of materials.
5. Study Guide for Reading Mastery.	Included at the end of this text.

CRITICAL ELEMENTS

To analyze reading materials, focus your attention on the four critical elements: response, stimulus, assessment,

INSTRUCTIONAL PLANNING SHEET

Subject area *Reading*

Topic *Decoding*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Sounds of letters presented one at a time	The student orally reads the correct sound.	Letters, representing sounds, printed on individual cards.	Teacher presents cards one at a time and asks student to read each sound orally.	Individual cards with letters printed on them.	Correct sound must be given in two seconds or less.
Sounds of letters all presented at the same time	The student orally reads the correct sounds.	Letters representing sounds printed on individual cards presented in random order.	Teacher presents cards to student in rows of six to 12 cards and asks the student to read each sound as rapidly as possible.	Individual cards with letters printed on them.	Correct sound said in order presented at a rate of 120 sounds per minute.
Sound blending	The student reads the correct sounds orally, without pausing between sounds, in the order presented.	Letters, representing sounds, printed on individual cards. Presented in random order.	Teacher presents cards to student in sets of two and/or three cards and asks student to read sounds orally without pausing between sounds.	Individual cards with letters printed on them.	Correct sounds given in sequence without pausing between sounds at a rate of 120 sounds per minute.
Reading words and nonsense words which are phonically regular	The student orally reads the correct words.	Words and/or nonsense words that are phonically regular, printed.	Teacher presents words in a list and asks student to read each word orally.	Words or nonsense words printed.	Reads words correctly at a rate of 60 per minute.
Reading phonically irregular words	The student orally reads the correct word.	Words that are phonically irregular, printed on individual cards.	Teacher presents cards in rows and asks student to read each word orally.	Irregular words printed on individual cards.	Reads words correctly at a rate of 60 per minute.
Reading sentences and paragraphs	The student orally reads the words correctly, in the correct sequence.	Words that are phonically regular and/or irregular printed in sentence form.	Teacher presents reading material, and asks the student to read it orally.	Reading material made up of words which the student knows.	Correctly reads each word in sequence at a rate of 120-200 words per minute with 98 to 100 percent accuracy.

and practice. As you examine each page, ask yourself the following questions concerning each element:

Response

1. What observable behavior is required for the skill?
2. Is the student required to say it, write it, or make it?
3. Is the observable behavior required on this page the same as that required for the skill?
4. Is the response the same as that specified in the skill statement?

Stimulus

1. What stimulus is required for the response?
2. What stimulus is provided on the student's page?
3. Is the stimulus provided the same as the stimulus specified in the skill statement?
4. Is a correction procedure specified in the teacher's guide?

Assessment

1. Does the teacher's edition or the student's edition specify procedures for initial placement and measurement of daily progress?
2. Are mastery criteria specified?
3. Are the assessment procedures the same as those on the Instructional Planning Sheet?

Practice

1. Is practice provided?
2. Does the practice provided appear to be sufficient?
3. Are the practice stimuli and responses the same as in the skill statement?

Practice Exercise 1

What are the four elements you will consider as you analyze instructional materials?

1. ______________________
2. ______________________
3. ______________________
4. ______________________

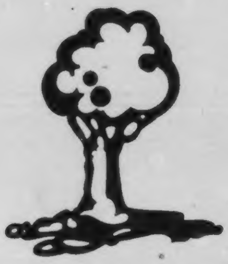
The correct answers are:

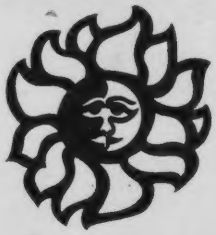
1. Response
2. Stimulus
3. Assessment
4. Practice

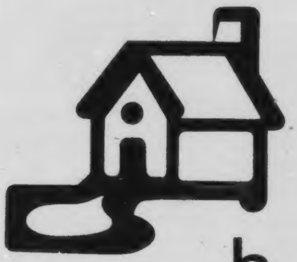
INSTRUCTIONAL EXAMPLES

Here are three examples taken from instructional materials designed to teach sound-symbol association. As you read and analyze the following examples, you will need to refer to the Sounds of Letters skill statement on the Instructional Planning Sheet for Reading. Also, you will need to ask those questions suggested above for the four critical elements–response, stimulus, assessment, and practice.

Material A







Stimulus:	A picture. Three letters printed under the picture.
Response:	Student says the name of the picture, then circles the letter that the name of the picture begins with.
Assessment:	Student circles the correct letter.
Practice:	Several worksheets with the same type of stimulus-response items as above, but using different pictures for examples.

Practice Exercise 2

Circle Yes or No

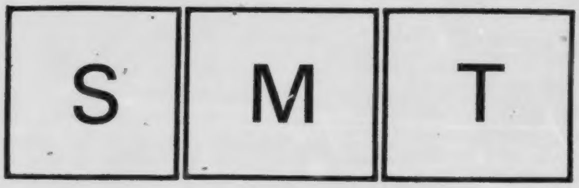
1. **Are the stimulus-response items in Material A the same as the sounds of letters skill statement?** **Yes No**
2. **Are the assessment procedures and mastery criteria specified?** **Yes No**
3. **Are the practice exercises the same as the instructional activities?** **Yes No**

The correct answers are:

1. No
2. No
3. Yes

Analysis of Material A. This material is inadequate. The stimulus response items do not meet the specified requirements. Material A presents irrelevant stimuli which are open to misinterpretation and lead to confusion. For "tree" the student could possibly say "plant"; for "sun" the student could say "moon"; and for "house," "building." The response is saying the name of the picture and making a circle around the letter. The response called for on the Instructional Planning Sheet is saying the sound. The assessment procedure is inappropriate as it calls for a circling response rather than the oral response specified on the Instructional Planning Sheet. Mastery criteria are not specified.

Material B



Stimulus:	Individual cards with letters printed on them.
Response:	Student reads orally the sound of the letter.
Assessment:	Student says correct sound in two seconds or less with 100 percent accuracy.
Practice:	Student says each sound as rapidly as possible.

Practice Exercise 3

Circle Yes or No

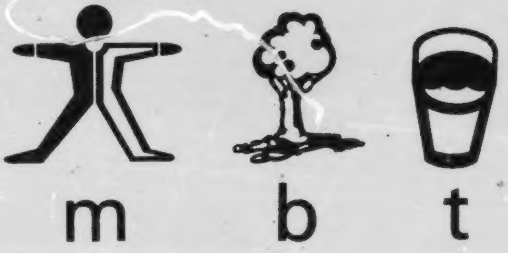
1. **Are the stimulus-response items in Material B the same as the skill statement for sound-symbol association?** **Yes No**
2. **Are the assessment procedures and mastery criteria specified?** **Yes No**
3. **Are the practice exercises the same as the instructional activities?** **Yes No**

The correct answers are:

1. Yes
2. Yes
3. Yes

Analysis of Material B. This material is adequate. The stimulus-response items meet the specified requirements. The assessment procedure calls for an oral response as specified on the Instructional Planning Sheet. Both accuracy and rate are specified as criteria for mastery. The practice exercises consist of the same type of stimulus-response items called for in the skill statement.

Material C



Stimulus:	Individual cards with a picture and a letter printed on them. Student is told that the sound for the letter is the same as the beginning sound of the name for the picture.
Response:	Student says the name of the picture and then says the sound for the letter.
Assessment:	Student says the correct name for the picture. Student says the correct sound.
Practice:	Student practices saying the names of each picture and the sound printed on each card.

Practice Exercise 4

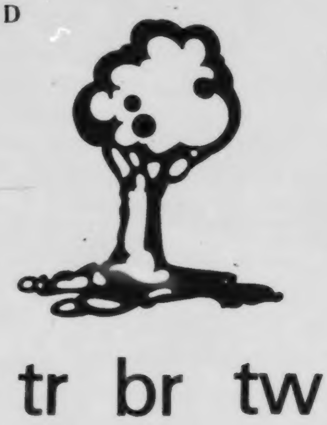
1. In Material C, the stimulus (the printed letter) is there, the response (reading the sound orally) is required, type of assessment is stated, and practice is provided. However, Material C is inadequate. Can you tell the reason why?

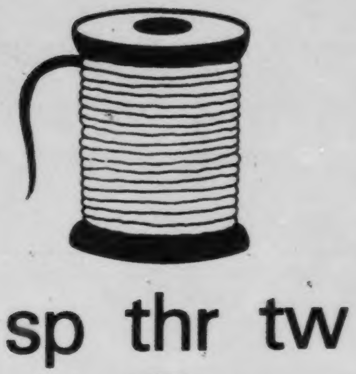
Analysis of Material C. Material C is inadequate because there are extraneous stimuli and responses. Pictures that are used as stimuli can lead to confusion. When a student looks at the pictures there are a number of possible interpretations. For , leaves, trunk, branches, twigs; for , bucket, pail, container, can; for , stick figure, father, drawing. The assessment procedure is inappropriate because the student must orally identify both the pictures and the sounds. Criteria for mastery are not stated.

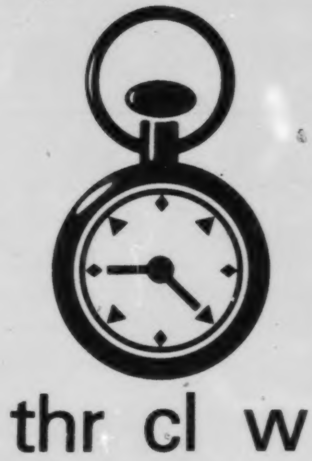
INSTRUCTIONAL EXAMPLES–BLENDING

Here are three examples taken from instructional materials designed to teach blending skills. As you read and analyze the following examples, refer to the Reading and Blending Sounds skill statement on the Instructional Planning Sheet for Reading. You will be expected to write the behavioral analysis of the material.

Material D







Stimulus:	A picture with three blends printed under the picture.
Response:	Student says the name of the picture, then circles the blend that the name of the picture begins with.
Assessment:	The student circles the correct blend.
Practice:	Several worksheets with the same types of stimulus-response items as above, but using different pictures for examples.

Practice Exercise 5

Remember the questions that need to be asked when you are analyzing the stimulus, response, assessment, and practice. Read the skill statement for blending on the Instructional Planning Sheet for Reading, compare it with the skill statement in Material D, and write the behaviorial analysis below.

Behavioral analysis. Is Material D adequate? Circle: Yes or No. Tell why.

Analysis of Material D. Your answer should be no. The stimulus-response items in Material D do not meet the requirements specified on the Instructional Planning Sheet. In Material D, the student is directed to make a circling response, but the required response should be oral, i.e. rapidly running the sounds together. The assessment procedure does not call for the oral response specified on the Instructional Planning Sheet. Mastery criteria are not stated.

Material E

tr	**br**	**fr**
_____end	**_____anch**	**_____ee**
_____ench	**_____ead**	**_____y**

Stimulus:	Incomplete words with spaces for letters to be written at the beginning.
Response:	Student writes the missing letters in the empty space provided.
Assessment:	The student writes in the correct letters to complete the word.
Practice:	Worksheets with the same types of stimulus-response items as above.

Practice Exercise 6

Refer to the Reading and Blending Sounds skill statement in the Instructional Planning Sheet for Reading, compare it with the stimulus, response, assessment, and practice specified in Material E, and write the behavioral analysis below.

Behavioral Analysis. Is Material E adequate? Circle one: Yes or No. Tell why.______________

____

____

____

____

Analysis of Material E. Again, your answer should be no. The student is directed to give a written response in Material E rather than the oral response required on the Instructional Planning Sheet. The assessment procedures are inappropriate as they call for a written response. Criteria for mastery are not specified. The practice materials, which consist of worksheets with the same type stimulus-response items seen in Material E, are inappropriate.

Material F

ram	**thamp**	**cam**
bring	**chim**	**whisper**

Stimulus:	Printed regular words, real or nonsense
Response:	Student says the sounds without stopping between sounds.
Assessment:	The student blends the correct sounds together in sequence without stopping between sounds at a rate of 120 correct sounds per minute with 100 percent accuracy.
Practice:	The student says the correct sounds in sequence without stopping between sounds.

Practice Exercise 7

Compare the skill statement for Material F with the Reading and Blending Sounds statement on the Instructional Planning Sheet. Write your analysis of Material F.

Behavioral analysis. Is Material F adequate? Circle one: Yes or no. Tell why.______________

____

____

Analysis of Material F. The stimulus-response items meet the requirements specified on the Instructional Planning Sheet. The assessment procedures are specified and appropriate. Assessment criteria are stated in terms of both accuracy and rate.

Summary

In summary, analyzing your current reading program requires that you:

1. Decide what the learner must do to demonstrate that he or she has learned (refer to the response column on the Instructional Planning Sheet for that subskill).
2. Describe the response which is required in the instructional materials.
3. Decide what the teacher must do and/or what materials are necessary to get the student to emit the behaviors which demonstrate learning (refer to the stimulus column on the Instructional Planning Sheet for that subskill).

4. Describe the stimulus which is required in the instructional materials.
5. Specify appropriate procedures for assessment.
6. Describe the assessment procedures specified in the instructional materials.
7. Specify appropriate criteria for mastery.
8. Describe the mastery criteria specified in the instructional materials.

ADAPTING INSTRUCTIONAL MATERIALS

After you have analyzed the materials you are ready to evaluate and adapt:

1. Compare your description of the response, stimulus, assessment procedures, and practice exercises contained in the instructional materials with the description of each of these elements (response, stimulus, assessment, and practice) on the Instructional Planning Sheet.
2. Evaluate your materials using the terms adequate, inadequate, stated, not stated, etc.
3. On the basis of your comparison and evaluation, decide what adaptations will be needed so that materials will meet the specifications on the Instructional Planning Sheet.
    a. What materials are needed in addition to those provided?
    b. What materials are unnecessary or inappropriate and should be deleted?

ADDING AND DELETING INSTRUCTIONAL MATERIALS

Decisions about adding or deleting materials from instructional programs should be directly related to the learner's behavior. Add only those materials which are not already provided and which are essential to get the desired response from the student and provide sufficient practice. Delete those materials which do not provide an appropriate stimulus for the student. Examples of materials which you may consider deleting are manipulatives, records and tapes, spirit duplicating masters, pictures, and posters.

PROBLEMS AND SUGGESTIONS

In grades one and two, a scope and sequence for teaching sounds is usually in the teacher's guide. Problems associated with the sound-presentation-sequence in some basal readers are:

1. The sequence for presenting sounds is not directly related to the practice in story reading.
2. Vowels frequently are not taught until second grade.
3. Excessive use of extraneous stimuli such as pictures.
4. No provision for systematic and substantial instruction and practice.
5. No criteria for mastery.

Before you begin to analyze and adapt your own reading materials:

1. Consider this basic rule of thumb: Don't spend time adapting and developing your own material if you can find a program that does an efficient job and also meets your stimulus-response requirements.
2. If you teach grades three to six, you probably will not find systematic procedures for teaching decoding in the teacher's guide.
3. If you cannot find systematic procedures for teaching decoding skills, then we suggest that you use the program included in this package, *Reading Mastery Program*, as a model of an adequate reading decoding program.

The *Reading Mastery Program* allows you to:

1. Have more control over the order of sound presentation. Decisions about the order in which sounds should be taught in most basal readers is arbitrary and unsystematic.
2. Individualize instruction in sound-symbol association for all of your students and greatly increase their reading efficiency.

Should you choose this alternative, remember to follow the directions in the manual for *Reading Mastery Program*.

Assignment 1

DIRECTIONS

1. **Read the teacher's manual for *Reading Mastery Program*.**
2. **Complete the study guide questions for the manual on pages 85-89 at the end of this text.**
3. **Check your answers with those provided at the end of the study guide.**
4. **Keep the completed study guide and use it as a reference.**

CRITERIA

1. **The manual in it's entirety must be read.**
2. **Each of the study guide questions should have a written answer.**
3. **Answers to the study guide questions should be checked with those at the end of the guide.**
4. **Necessary corrections on the study guide questions should be made.**

Assignment 2

DIRECTIONS

1. Review the assessment procedures in the teacher's manual for Reading Mastery.
2. Use the prepared form for recording the results of the assessment on page 79.
3. Using the procedures specified in the manual, assess the low performer (on reading skills) in your classroom.
4. Make two copies of the form on which you recorded your test results. Send one copy to the address on page 6. Keep one copy for your records.

You will need these test results to complete Assignment 7.

CRITERIA

1. Assessment procedures and criteria must be the same as those specified in the manual.

Assignment 3

DIRECTIONS

1. Analyze a first level or first grade basal reader.
    a. Read each of the decoding skill statements on the Instructional Planning Sheet for Reading.
    b. Read the pages in the teacher's guide which cover the instructions for teaching each of the decoding skills.
    c. Examine the pages in the student reader and workbook which provide instruction and practice on each of the decoding skills listed on the Instructional Planning Sheet.
2. On the response form for Analyzing and Adapting Instructional Materials, complete the analysis section for *each of the decoding skills.*
   You have been provided with duplicate copies of the response forms used for analyzing and adapting reading materials. Send one copy to the address on page 3. Keep one copy for your own records.
    a. Fill in the information at the top of the sheet.
       —material
       —publisher
       —publication date
    b. Write in the page numbers read for your analysis of each of the decoding skill statements.
    c. Write a brief description of the response, stimuli, assessment and practice which are contained in the material.
    d. If there are several different instructional procedures used to teach the decoding skills listed on the Instructional Planning Sheet, follow the procedures specified under b and c for the most commonly used procedure.

CRITERIA

A completed response form for Analyzing and Adapting Instructional Materials will contain the following information for each of the decoding skill statements:

Response

a. What observable behavior is required for the skill?
b. What is the student required to do? Does he or she say it, write it, make it, circle it, cross it out, etc.?

Stimulus

a. Is the stimulus specified in the teacher's guide (instructions)?
b. What stimulus is provided on the student's page?

Assessment

a. Does the teacher's edition or the student's edition specify procedures for initial placement, and measurement of daily progress?
b. Are mastery criteria specified? Are they appropriate?

Practice

a. Is practice provided? Is practice (the type of) specified in the teacher's guide?
b. Does the practice provided appear to be sufficient? Is there enough practice to insure that the student will be able to demonstrate mastery of a particular skill?
c. Are the practice stimuli and response the same as those specified in the skill statement?

Assignment 4

DIRECTIONS

1. Use the terms (adequate, inadequate, stated, not stated, etc.) under each heading (Response, Stimulus, Assessment, and Practice) and write an evaluation of the material analyzed in Assignment 3.
2. Use the information from your analysis and make the necessary adaptations so that your materials will meet the requirements specified for each of the decoding skills on the Instructional Planning Sheet.
   a. Write a brief description of the changes you need to make under each of the headings, Response, Stimulus, Assessment, and Practice.
   b. Make the materials for two of the sub-skills which you will need for the adaptations (changes) you have described on the response form for Analyzing and Adapting Instructional Materials.

CRITERIA

Adaptations of the materials should include the following:

Response

The response is observable, verifiable, and measurable.

Stimulus

a. The stimulus matches the response called for.

Assessment

a. Assessment for initial instruction specifies accuracy.
b. Assessment for practice of skills specifies both accuracy and rate.

Practice

a. The stimulus-response items called for in the practice materials match the stimulus-response items from the instruction.

A description of the adaptations should state the types of changes which are necessary so that the instructional materials will meet the specifications listed on the Instructional Planning Sheet for that particular skill. The description of the adaptations should include:

a. The necessary deletions.
b. The necessary additions.

INSTRUCTIONAL PROCEDURES

An instructional procedure is like a daily lesson plan that needs to be written just once for each skill that is being taught. Instructional procedures should include:

1. **Method for Teaching Unknown Skills**
   a. Sequence the presentation of skills and sub-skills.
   b. Determine the frequency of introducing new material.
2. **Practice Procedures**
   a. Specify a routine for practicing skills that have been taught.
   b. Establish a method for monitoring student practice.
3. **Measuring Daily Progress**
   a. Rate of response should be used to measure skills for which the student response for each item is of approximately the same difficulty.
   b. An accuracy measurement is sufficient for those skills in which the responses are of unequal length.

Daily practice and daily measurement are musts. Practice results in automatic responses and overlearning. Daily measurement provides powerful feedback to an individual student about his or her success. Daily measurement of student performance also provides the teacher feedback on the effectiveness of the teaching.

Practice Exercise 8

Why is it critical to measure a student's daily progress?

____

____

____

Your answer should include two points, (1) daily progress measurement lets the student know every day how well he or she is doing, and (2) it lets the teacher know whether his or her teaching is effective.

MANAGEMENT OF INSTRUCTIONAL MATERIALS

Now that you have analyzed and adapted your current reading program, the next step is to establish procedures for managing your instructional materials. Good management procedures will allow you to teach more effectively. Basically, there are three steps to management:

Assignment 5

DIRECTIONS

1. **Write an instructional procedure for teaching one of the decoding skills which you have analyzed and adapted.**
   a. **Write a description of the methods you will use to teach unknown skills.**
   b. **Specify a procedure for practice.**
   c. **Devise a method for measuring daily progress.**

CRITERIA

1. **A description of methods should include:**
   a. **A sequence for presenting skills.**
   b. **An explanation of how to determine the frequency of introducing new material.**
2. **Procedures for practicing skills should specify:**
   a. **A routine for practicing skills.**
   b. **A method for monitoring student practice.**
3. **Methods for measuring daily progress should:**
   a. **State the appropriate type of measurement to be used.**
   b. **Provide a system or routine for taking daily measurement.**

1. Design Record Keeping Procedures

(a) Graphs and/or charts provide an easy method for monitoring individual students or progress of an entire class through a unit of study or a sequence of skills. (b) A separate graph or chart should be used for each sub-skill a student is currently practicing. (c) Here is another procedure in which you record only the scores:

Date	Number correct	Number incorrect	Time in seconds	Rate correct
5-19	51	2	30	102
5-20	53	0	29	110

2. Specify Storage and Retrieval of Material and Records

a. Make a folder for each student.
b. Store the folders in a box or file drawer that is accessible to the students.
c. Store the instructional material in places where it is accessible to students.
d. Think of all the management activities that your students can help you with. Train them to gradually take more responsibility.

Teaching and practicing sub-skills using their individual procedures demand that much of the work be assumed by the students.

3. Specify the Responsibilities of the Teacher and Students

Teacher

1. Monitors the timing that is recorded.
2. Determines mastery criteria.
3. Selects and adapts material.
4. Teaches new skills.

Student

1. Gets his or her own material and file folder.
2. Practices assignments alone or with a partner.
3. Listens to other students practice.
4. Records his or her rate or score.
5. Puts away his or her material and file folder.

Practice Exercise 9

What responsibilities in classroom management can students be trained to assume?

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________
6. ____________________

The correct answers are:

1. Get his or her own material and file folder.
2. Practice assignments alone or with a partner.
3. Listen to other students practice.
4. Record his or her rate or scores.
5. Put away material and file folder.

Assignment 6

DIRECTIONS

1. Develop a management system for one of the decoding skills which you have analyzed and adapted.
2. Send a copy of the management plan, including whatever graphs or charts you plan to use, a written description of the adapted materials, and a written instructional plan. See page 6 of the text for the address.

CRITERIA

1. The management system must include:
    a. Record keeping procedures such as those described on page 17. Include the graphs and/or charts you have devised.
    b. Specifications for storage and retrieval of material and records.
    c. Designation of responsibilities for both teacher and students.

Assignment 7

DIRECTIONS

1. After the adapted materials, instructional procedures, and management plan have been approved, use them with a student or students for 10 consecutive days.
2. Send a copy of the records of student performance and any revisions which you have made.

CRITERIA

1. The adapted materials, instructional procedures, and management plan must be used with at least one student and not more than five students for 10 consecutive days the student is in attendance.
2. A copy of the records of student performance should include:
    a. A list of the skills which the student had mastered at the time of his or her first assessment.
    b. A graph indicating the student's best performance for each of the 10 days.
    c. Each skill which has been added to the student's list should be noted on the graph by writing the skill on the date line.
3. Write a brief statement indicating whether there is or is not a need for revisions. If there is a need, write a summary of the revisions you will now make (on the adapted materials, instructional procedures, or management plan) based on the collected data.

Analyzing and Adapting Mathematics Materials

In 1973 new math was being taught in approximately 85 percent of the US school systems. New math differs from traditional math primarily in its emphasis on studying numbers to discover their laws and principles. Children of average and above average intelligence have benefited from the use of new math.

One of the basic concerns generated over the use of new mathematics has been the concern of meeting the future needs of low performing students. Some have expressed the view that traditional mathematics was the mathematics used and the mathematics needed in life.

Many teachers have abandoned new-math textbooks in favor of teaching materials they prepare themselves. Some publishing companies have discontinued their lines of new-math textbooks and have prepared texts that blend principles of new math with a fresh emphasis on computation. The emphasis has not been to eliminate either the new or the traditional math. Rather, attempts have been made to combine the best of both types of mathematics. The main point of agreement concerning the suggestion to combine the best of both mathematics systems was the need to develop computation skills. Speed and accuracy in arithmetic computation is seen as particularly critical. In order for these skills to be functional, it is felt that students need to develop these skills to the extent that they are completely automatic.

The following instruction on analyzing and adapting mathematics materials reflects these trends. The purpose of this chapter is:

1. To use the same basic format presented in the first chapter on Analyzing and Adapting Reading Materials for analyzing and adapting mathematics materials.
2. To provide instruction on evaluating mathematics materials directed at presenting initial instruction of a skill and those meant for providing practice.

INSTRUCTIONAL PLANNING SHEET

The Instructional Planning Sheets for Mathematics are presented on the next several pages. This plan is based on the premise that basic mathematical skills must be taught to the extent that they are completely automatic. The particular sub-topics and skill statements (objectives) chosen are from programs that have a proven record of success. It is not intended that these objectives are all inclusive nor that another sequence is not equally as logical. This sequence of skills does lead to mastery of the basic skills needed in addition, subtraction, multiplication, and division of single digit, positive whole numbers. You may wish to add to the sequence or to rearrange the order of teaching some of the skills. Mathematics skills are so diverse that there is not only one sequence in which they may be learned. The important point to remember if you do change the sequence, is don't try to teach skills requiring prerequisites if the prerequisites have not been taught. Don't make assumptions about prerequisite skills without testing them.

At this point refer to the Instructional Planning Sheet on page 20.

PROCEDURES FOR ANALYZING AND ADAPTING MATHEMATICS MATERIALS

In this chapter you will be taught how to analyze and adapt materials which have been designed to teach basic mathematics. In the first section you will be analyzing several examples taken from instructional materials designed to give *initial instruction* in basic mathematics. In the second section of this text, examples of *practice* materials will be analyzed. The concept of initial instruction and practice will be closely examined in this chapter.

CRITICAL ELEMENTS

To analyze math materials, focus your attention on the four critical elements of response, stimulus, assessment, and practice. As you examine each page, ask yourself the following questions concerning each element.

Response

1. What observable behavior is required for the skill?
2. Is the student required to say it, write it, or make it?
3. Is the observable behavior required on this page the same as that required for the skill?
4. Is the response the same as that required in the skill statement?

Stimulus

1. What stimulus is required for the response?
2. What stimulus is provided on the student's page?

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Counting*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Rote counting from 0 to 20	Student counts orally from 0 to 20.	Teacher's command to count.	Teacher commands student to count orally from 0 to 20.	None	Student counts from 0 to 20 orally, in sequence, within 21 seconds, without repetitions or omissions.
Rational counting 0 to 20 objects	Student orally counts objects.	Objects to be counted. Teacher's command to count.	Student is presented with objects to count orally. Five groups of 20 or less, each having a different number of objects.	Objects to be counted.	Verbal counting corresponds one-to-one with objects counted. Counts at a rate of 1 object per second.
Rote counting forward, starting from any number 0 to 20.	Student counts orally from a given number to 20.	Teacher's command to count from a given number to 20.	Teacher commands student to count orally from a given number to 20. Five trials, each starting with a different number below 20.	None	Student counts orally from the given number to 20 in sequence without repetitions or omissions at a rate of one number per second, on all five trials.
Rote counting backwards from 20 to 0.	Student counts orally from 20 to 0.	Teacher's oral command to count.	Teacher commands student to count orally from 20 to 0.	None	Student counts orally from 20 to 0, in sequence, without repetitions or omissions, within 21 seconds.
Rote counting backwards, starting with any number from 20 to 0.	Student counts backwards orally from a given number to 0.	Teacher's command to count from a given number to 0.	Teacher commands student to count orally from a given number to 0. Five trials, each starting with a different number below 20.	None	Student counts orally from a given number to 0 in sequence without repetitions or omissions at a rate of one number per second on all five trials.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Reading Numerals and Symbols*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Reading numerals 0 to 20.	Student orally reads each numeral 0 to 20.	Numerals printed on individual cards.	Present the numerals in random order, one at a time.	Numerals from 0 to 20 printed on individual cards.	Orally reads each numeral correctly within one second.
Reading the symbols + and =	Student says the name of each of the symbols.	Symbols printed on individual cards.	Present the symbols on individual cards, one at a time.	Symbols + and = printed on individual cards.	Orally reads each symbol correctly within one second.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Writing Numerals and Symbols*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Writing numerals from 0 to 20 in sequence.	Student writes each numeral in sequence from 0 to 20.	Teacher's oral command to write numerals from 0 to 20.	Teacher commands student to write numerals in sequence from 0 to 20.	Pencil, paper	Writes numerals from 0 to 20 in sequence without omissions or repetitions within 42 seconds.
Writes any numeral from 0 to 20 upon command.	Upon command, student writes any numeral from 0 to 20.	Teacher's command to write a numeral.	Teacher commands student to write a numeral, five numerals, selected at random, presented one at a time.	None	Numeral correctly written within 2 seconds if single digit, 3 seconds if double digit.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Equality*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Completing mathematical statements containing an equal sign and no computation.	Student writes the answer to the mathematical statement.	Incomplete mathematical statements printed in the form: 3 = 5 =	Present the incomplete mathematical statements to the student all at once.	Incomplete mathematical statements printed on paper.	Student writes the correct number to complete the mathematical statement at a rate of one digit every 2 seconds.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Addition of Single Digit Numbers*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
There are several ways to break down this topic into subtopics. Here are some examples:					
1. Plussing each digit to all other digits.	Student writes the sum to each problem.	Addition problems printed in the form: (0 to 9) + 1 (0 to 9) + 2 (0 - 9) + 3 etc.	Present the addition problems to the student.	Addition problems printed in the form: 9 + 1 = or 9 + 1	Writes the sum for each at a rate of 40 digits per minute with 100 percent accuracy.
2. Plussing two addends with specified sums. For example: – addends with sums of 5 or less – addends with sums of 9 or less – addends with sums of 12 or less. etc.	Student writes the sum to each problem.	Printed addition problems with specified sums.	Present all the addition problems to the student with sums of x.	Addition problems printed in the form: 2 + 3 = or 2 + 3	Writes the sum for each problem at a rate of 40 digits per minute with 100 percent accuracy.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Subtracting: All single digit positive numbers subtracted from all numbers where there can be a single digit answer.*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
There are different ways of breaking down this topic. Here are some examples:					
1. The same subtrahend is subtracted from all minuends that will give a difference of 9 or less. For example: 9 8 7 Minuend $-\underline{3}$ $-\underline{3}$ $-\underline{3}$ Subtrahend 6 5 4 Difference	The student writes the difference for each problem.	Subtraction problems containing for example: (0 to 9)–0 (1 to 10)–1 (2 to 11)–2 etc.	Present the subtraction problems to the student all at the same time.	Subtraction problems printed in the form: 9–1 = or 9 $-\underline{1}$	Writes the difference for each at a rate of 30 per minute with 100 percent accuracy.
2. The same minuend minus all numbers below the minuend which give a difference of 9 or less (positive numbers only) for example: 5–(0 to 4) = 6–(0 to 5) = 7–(0 to 6) = etc.	The student writes the difference for each problem.	Subtraction problems printed in the form: 5–(0 to 4) = etc.	Present the subtraction problems to the student all at once.	Subtraction problems printed in the form: 5–4 = or 5 $-\underline{4}$	Writes the difference to each problem at a rate of 30 per minute, with 100 percent accuracy.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Rote Counting*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Rote counting, counting forward from 0 to 99.	Student counts orally from 0 to 99.	Teacher's command to count.	Teacher commands student to count orally from 0 to 99.	None	Student counts orally without repetitions or omissions at a rate of 60 numbers per minute (0–99 in 1:39).

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Reading Numerals and Symbols*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Reading numerals 0 to 99.	Student orally reads each numeral 0 to 99.	Numerals printed on individual cards.	Present the numerals in random order one at a time.	Numbers from 0 to 99 printed on individual cards.	Says each number within one second with 100 percent accuracy.
Reading symbols x, ÷, and ⟌	Student says the name of each of the symbols.	Symbols printed on individual cards.	Present the symbols on individual cards.	Symbols x and ÷ printed on individual cards.	Says the name of each symbol correctly within one second.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Writing Numerals and Symbols*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Writing numerals from 0 to 99 in sequence.	Student writes each numeral in sequence from 0 to 99.	Teacher's oral command to write numerals from 0 to 99.	Teacher commands student to write numerals in sequence from 0 to 99.	Pencil and paper.	Writes numerals from 0 to 99 in sequence without omissions or repetitions, within 4:30.
Writes any numeral from 0 to 99 upon command.	Upon command student writes any numeral from 0 to 99.	Teacher's command to write a numeral.	Teacher commands student to write 10 randomly selected numerals between 0 and 99, presented one at a time.	Pencil and paper.	Writes each numeral correctly within 2 seconds of teacher's command.
Writing symbols x, ÷, and √	Upon command, student writes each symbol.	Teacher's command to write a symbol.	Teacher commands student to write each symbol.	None	Writes each symbol correctly within 2 seconds of teacher's command.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Place Value*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Writing a standard two-digit number in expanded notation.	The student writes the number of tens and the number of ones contained in a two digit number.	Two-digit numbers and an answer sheet with the words "ones" and "tens" printed on it.	Present 10 printed two-digit numbers and an answer sheet.	Two digit numbers printed on a sheet with the words "ones" and "tens" printed next to each number.	Writes the value of each digit with 100 percent accuracy.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Addition*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Problems with double digit addends, no carrying, and sums of 99 or less.	Student writes the sum to each problem.	Addition problems with double digit addends, no carrying, and sums of 99 or less.	Present addition problems to the student.	Addition problems printed in the form: $46 + 22 =$ or $\begin{array}{r} 46 \\ + \underline{22} \end{array}$	Writes the sum for each problem at a rate of 20 per minute with 100 percent accuracy.
Problems with double digit addends, with carrying in the ones place and a sum of 99 or less.	Student writes the sum to each problem.	Addition problems with double digit addends, with carrying in the ones place and sums of 99 or less.	Present addition problems to the student.	Addition problems printed in the form: $\begin{array}{r} 55 \\ + \underline{37} \end{array}$	Writes the sum for each problem at a rate of 20 per minute with 100 percent accuracy.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Subtraction*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Problems with double digit minuends and subtrahends, with no borrowing.	Student writes the difference for each problem.	Subtraction problems with double digit minuends and subtrahends and no borrowing.	Present subtraction problems to the student.	Subtraction problems printed in the form: 55−25 = or 55 $\underline{-25}$	Writes the difference for each problem at a rate of 20 per minute with 100 percent accuracy.
Problems with double digit minuends and subtrahends, with borrowing in the ones place.	Student writes the difference to each problem.	Subtraction problems with double digit minuends and subtrahends and borrowing in the ones place.	Present subtraction problems to the student.	Subtraction problems in the form: 62 $\underline{-55}$	Writes the difference for each problem at a rate of 20 per minute with 100 percent accuracy.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Multiplication of two single digit numbers*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Multiplying numbers 0-9 by numbers 0-9.	Student writes the product to each problem.	Multiplication problems with single digit factors.	Present multiplication problems to the student.	Multiplication problems printed in the form 3 x 4 = or $\begin{array}{r}4\\ \underline{\times 3}\end{array}$	Writes the product for each problem at a rate of 40 digits per minute with 100 percent accuracy.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Division*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Problems with single digit divisors and quotients and dividends of 99 or less, and no remainders.	Student writes the quotient to each problem.	Division problems with single digit divisors and quotients and dividends of 99 or less.	Present division problems to the student.	Division problems printed in the form $15 \div 5 =$ or $5\overline{)15}$	Writes the quotient for each problem at a rate of 40 digits per minute with 100 percent accuracy.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Counting*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Rote counting beyond 100.	Student counts orally from any number to any number less than 1000.	Teacher's command to count, from a specified number to a specified number.	Teacher commands student to count orally from a specified number to a specified number. Five trials.	None	Student counts orally in sequence without repetitions or omissions. 100 percent accuracy, one number per second.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Writing Numerals*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Writing numerals beyond 100.	Student writes numerals beyond 100.	Teacher's command to write numerals starting with a specified number and ending with a specified number.	Teacher commands student to write numerals in sequence starting with a specified number and ending with a specified number. Five trials.	None	Writes numerals in sequence without omissions or repetitions at a rate of 40 digits per minute.

INSTRUCTIONAL PLANNING SHEET

Subject area *Mathematics*

Topic *Place Value*

SUBTOPIC	SKILL STATEMENT		ASSESSMENT		
	RESPONSE	STIMULUS	PROCEDURES	MATERIALS	CRITERIA
Writing a standard three digit number in expanded notation.	Student writes the number of ones, tens, and hundreds contained in a three digit number.	Three digit numbers and the words "ones," "tens," and "hundreds" printed on the answer sheet.	Present the three digit numbers and an answer sheet.	Three digit numbers printed on a sheet with the words ones, tens and hundreds printed next to each number.	Writes the value of each digit with 100 percent accuracy. Fourteen per minute.
Writing a standard four digit number in expanded notation.	Student writes the number of ones, tens, hundreds, and thousands contained in a four digit number.	Four digit numbers and the words ones, tens, hundreds, and thousands printed on the answer sheet.	Present the four digit numbers and an answer sheet.	Four digit numbers printed on a sheet with the words ones, tens, hundreds and thousands printed next to each number.	Writes the value of each digit with 100 percent accuracy. Ten per minute.

3. Is the stimulus the same as that required in the skill statement?
4. Is a correction procedure specified in the teacher's guide?

Assessment

1. Does the teacher's edition or the student's edition specify procedures for initial placement and measurement of daily progress?
2. Are mastery criteria specified?
3. Are the assessment procedures the same as those specified on the Instructional Planning Sheet for Mathematics?

Practice

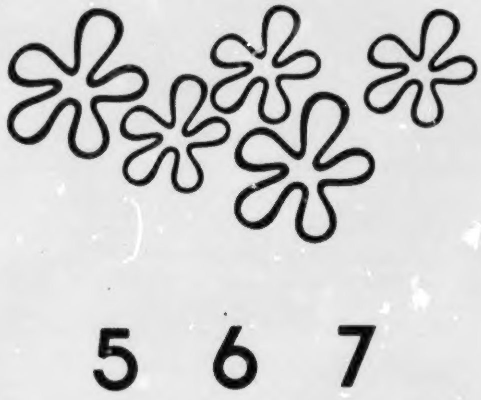
1. Is practice provided?
2. Does the practice provided appear to be sufficient?
3. Are the practice stimuli and responses the same as those specified in the skill statement?

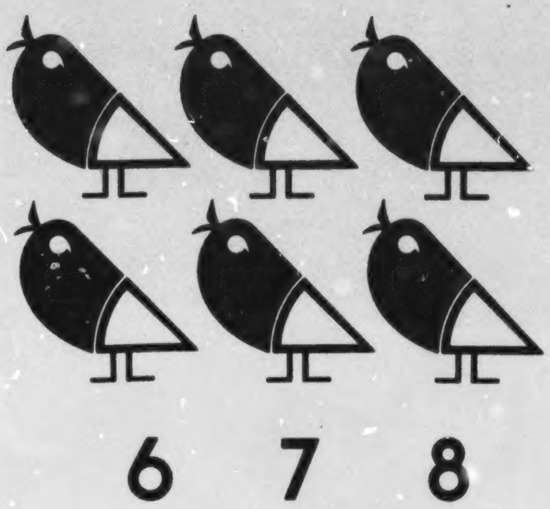
INITIAL INSTRUCTION

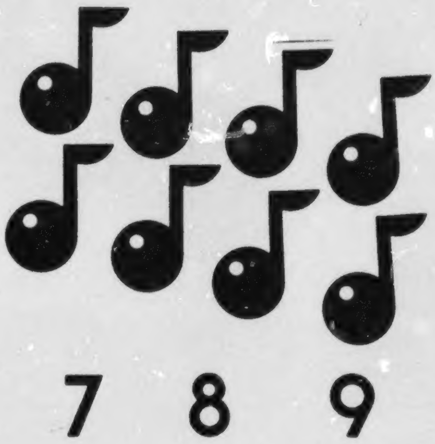
Materials A through F are examples of math materials designed for initial instruction. Basic instructional examples such as these are found throughout mathematics textbooks. The purpose of such material is to introduce new concepts to the student. The teacher's manual generally includes a set of objectives and instructions (general guidelines) on how to present the new concept. Guidelines for the teacher's presentation may be the determining factor in the student's understanding and eventual mastery of the new concept. Along with each of the Materials A through F is a set of objectives and instructions for the teacher. As you read through this unit you will need:

Materials	Location
Instructional Planning Sheet for Mathematics	Pages 20 through 36 of the text
Response Form for Analyzing and Adapting Instructional Materials	Page 81 of the text.

Material A–Number Recognition







Objective:	Given pictures of sets of objects from 0-9 and corresponding numerals, the pupil will be able to circle the number of each set.
Instructions:	Tell the pupils that they are to decide the number of objects each set has and to ring the numeral for that number.
Stimulus:	Pictures of sets of 0-9 objects and corresponding numerals.
Response:	The pupil circles the number for each set.
Assessment:	The student circles the correct number.
Practice:	Several worksheets with the same type of stimulus-response items as above but using different pictures for examples.

Practice Exercise 10

Circle Yes or No

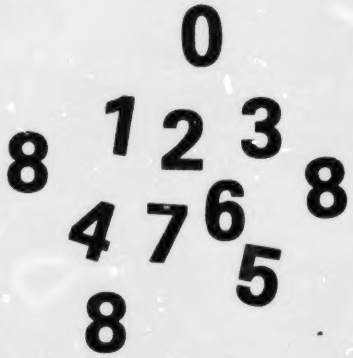
1. **Are the stimulus-response items in Material A the same as those specified on the Instructional Planning Sheet for Mathematics under Number Recognition?** **Yes No**
2. **Are the assessment procedures and mastery criteria specified?** **Yes No**
3. **Are the practice exercises the same as the instructional activities?** **Yes No**

The correct answers are:

1. No
2. No
3. No

Analysis of Material A. This material is inadequate. The stimulus-response items do not meet the specified requirements. The skill called for on the Instructional Planning Sheet is number recognition with an oral response. Material A requires both rational counting and number recognition. Material A requires a circling response as contrasted to the oral response prescribed on the Instructional Planning Sheet. The assessment procedure is inadequate as the pupil could possibly guess the correct answer, and the number of correct responses or rate is not specified. The practice exercises are inappropriate as they also call for a circling response.

Material B–Number Recognition



The teacher presents instruction on identifying the number 8. The students have previously learned numbers 0 through 7.

Objective:	The students orally identify all numbers from 0 to 8.
Instructions:	(for teacher presentation) 1. Identify the new number (8). Teacher points to the new number, and 2. Asks the children: "What number is this?" Do this two times. 3. Point to other numbers on the page, asking the question: "Is this eight?"
Stimulus:	A sheet with printed numbers from 0-8.
Response:	The student orally identifies each number the teacher points to.
Assessment:	The student says the number in two seconds or less with 100 percent accuracy.
Practice:	The student says each number as rapidly as possible.

Practice Exercise 11

Circle Yes or No

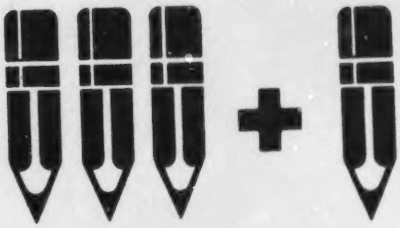
1. **Are the stimulus-response items in Material B the same as those specified in the skill statement on the Instructional Planning Sheet?** **Yes No**
2. **Are the assessment procedures and mastery criteria specified?** **Yes No**
3. **Are the practice exercises the same as the instructional activities?** **Yes No**

The correct answers for Material B are:

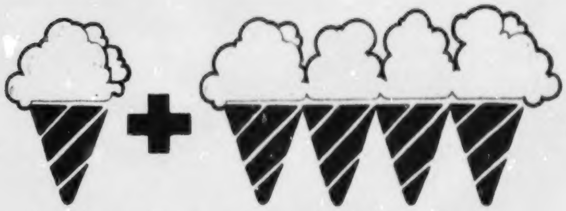
1. Yes
2. Yes
3. Yes

Analysis of Material B. This material is adequate. The stimulus-response items meet the specified requirements. The assessment procedure calls for an oral response as specified on the Instructional Planning Sheet. Both accuracy and rate are specified as criteria for mastery. The practice exercises match the instructional activities.

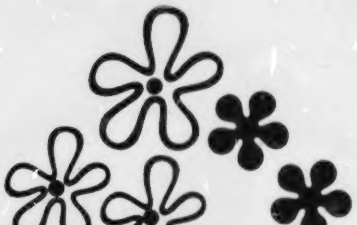
Material C—Addition



3 + 1 = □



1 + 4 = □



3 + 2 = □

Objectives:	Given addition equations having sums of 5 or less and related illustrations of sets, the pupil will be able to solve the equations.
Instructions:	In this lesson the children are encouraged to think of putting two sets together. Their work with equations is to be related to pictures of sets. The children should be given counters to use as they wish. Each child should feel free to use counters and discontinue use of them according to his or her own choice. Some of the children would also benefit from manipulating plastic or tagboard number symbols.
Stimulus:	Addition equations with sums of 5 or less and related illustrations of sets.
Response:	The student solves (completes) the equation.
Assessment:	The student writes the answers with 100 percent accuracy.
Practice:	Several worksheets with the same type of stimulus-response items as above but using different pictures for examples.

Practice Exercise 12

In Material C, the stimuli (printed addition equations) are there, the response (student solves the equation) is required, criteria for assessment is stated, and practice is provided. However, Material C is inadequate. Can you tell the reason why?

Analysis of Material C. In Material C the procedure outlined to help the student solve the equation is vague. The teacher is provided with the option of using several different prompts (pictures, counters, etc.). The procedure for teaching the pupil how to read and solve an addition equation is not stated. The assessment criteria would be appropriate for materials for initial instruction.

Material D—Addition

5 + 2 = □ 6 + 3 = □

Objective: To solve statements of addition (The student works with a combination of lines and numerals to derive the equations. In subsequent lessons they work only from numerals.)

Instructions: (for teacher presentation)

1. Draw the problem on the board.
2. Point to the equal sign. Ask, "What's this?" The students reply, "An equal sign." Ask, "What does it tell us?" The students reply, "We have to end up with the same amount on both sides of the equal sign."
3. Help the children determine on which side of the equal sign they can begin counting. Point to the side with the box and ask, "Does it tell me what to count to?" The students should answer "No." Point to the other side of the equal sign and ask, "Can we count on this side of the equal sign?" The students should reply, "yes."
4. Point to the numeral without the line under it. Say, "Don't make lines for this numeral."
5. Point to the numeral with the line under it. Say, "Just make lines for this numeral."
6. After the children draw the lines on the first line they should say the first numeral and count the lines they drew on the bar: 6, 7.
7. They should write the answer (7) in the box.

Stimulus: Printed addition equation. Teacher's oral questioning of student.

Response:

1. Students orally respond to teacher's questioning.
2. Students draw the correct number of lines.
3. Students write the correct solution to the equation.

Assessment:

1. The student verbalizes the equality rule correctly.
2. The students begin counting on the right side of the equal sign.
3. The students draw the correct number of lines.
4. The students write the correct answers to the equations with 100 percent accuracy.

Practice: Worksheets with several equations (similar to those in the example) printed on each sheet. The student works independently.

Practice Exercise 13

Remember the questions that need to be asked when you are analyzing the stimulus, response, assessment, and practice. Read the skill statement on the Instructional Planning Sheet for Mathematics. Topic: Addition of single digit numbers. Compare it with the skill statement in Material D and write an analysis below.

Analysis. Is Material D adequate? Circle Yes or No. Tell why.____________________

____

____

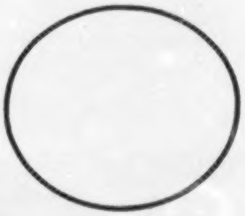
Analysis of Material D. Your answer should be "yes." Material D is adequate. The stimulus-response items meet the requirements specified on the Instructional Planning Sheet. The assessment procedure specifies each of the student behaviors leading up to the written response as indicated on the Instructional Planning Sheet. Assessment criteria specifies a measurement of accuracy which is appropriate for initial instruction. The materials contained in the practice exercises match the instructional materials.

Material E—Subtraction

Put in	Take away	How many left
5	2	

Solve the equation

5 − 2 =



Put in	Take away	How many left
4	1	

Solve the equation

4 − 1 =

Objective: Given a subtraction equation involving combinations of five or less, the child will be able to solve the equation through use of physical objects or appropriate pictures.

Instructions: Children work first with sets, acting out the "take away" action with numerals and the symbols - and =. Keep in mind that although we "take-away" a subset of a set, we subtract numbers. Although a subtraction equation such as 4 - 1 = 3 would be introduced as "four take-away one is three," an on-going objective for the year is to help children eventually understand and use the phrase "four minus one is three," or four subtract one is three."

Stimulus: Printed subtraction equations. Pictures. Teacher's oral command.

Response: Students work with sets and act out the take-away procedure. Students solve the equations.

Assessment: The student writes the solution to the equation.

Practice: Worksheets with several subtraction equations, involving combinations of five or less, printed on each sheet.

Practice Exercise 14

Refer to the skill statement on the Instructional Planning Sheet for Mathematics, subtopic: Subtraction. Compare the stimulus, response, assessment, and practice specified in Material E, and write the analysis below.

Analysis. Is Material E adequate? Circle one: Yes or No. Tell why.________________________

____

Analysis of Material E. This material is inadequate. It contains extraneous stimuli (circles) and prompts (printed instructions—put in, take away, how many left). The use of multiple terms to describe the response the student is to make (take away, minus, and subtract) and the suggested instructional procedure of putting in a set of objects and then taking away a subset of objects all may lead to confusion. The assessment procedure specifies that the student write the answer. However, criteria for accuracy and rate are not specified.

Material F—Subtraction

$$6 - 4 = \square$$

$$7 - 2 = \square$$

Objective: To solve subtraction problems by drawing lines for sets and then subtracting by crossing out lines.

Instructions:

(1) Draw the problem on the board.

(2) Point to the equal sign. Ask, "What's this?" The students reply, "An equal sign." Ask, "What does it tell us?" The students reply, "We have to end up with the same number on both sides of the equal sign."

(3) Ask, "Who knows which side we start counting on?" Students reply, "The empty box is on the other side, so we start counting on this side."

(4) Point to the minus sign. Ask, "Who knows what this is?" Students reply, "A minus sign."

(5) Say, "What does the minus sign tell us to do?" Students reply, "It tells us to get rid of some lines."

(6) Point to the numeral 6. Ask, "How many in this group?" When the students say "6", draw 6 lines on the bar below 6.

(7) Point to the minus sign and say, "And it tells us to minus how many?" The students reply, "Minus four."

(8) The teacher crosses out the lines as she says, "Minus one, minus two, minus three, minus four."

(9) After crossing out the lines, point to all of them. Say, "These lines are gone. I crossed them out."

(10) Point to the remaining lines—the ones that are not crossed out. Say, "These are the only lines we have on this side of the equal sign. Let's count them."

(11) Point to each line as the children count 1,2. Ask, "How many did we end up with on this side of the equal sign?" Students reply "Two." Ask, "So how many do we end up with on the other side?" Students reply, "Two." "So what goes in the empty box?" Write a 2 in the box.

(12) Point to each part of the equation as you read, "Six minus four equals two." Have the children read the statement with you.

(13) Dictate the equation to the student. The student writes the equation and the solution.

Stimulus: (1) Printed equations in the form $6 - 4 =$
(2) Teacher's oral questioning.

Response: (1) The student orally responds to teacher's questioning.
(2) The student writes the equation and the solution.

Assessment: Student writes the solution to the equation with 100 percent accuracy.

Practice: Worksheets with equations printed in the same form as above. Students work independently.

Practice Exercise 15

Compare the skill statement for Material F with the skill statement on the Instructional Planning Sheet. Write your analysis of Material F. Analysis. Is Material F adequate? Circle one: Yes or No. Tell why. ____________________

____

____

Analysis of Material F. This material is adequate. The stimulus-response items meet the requirements specified on the Instructional Planning Sheet. The assessment procedure calls for a written response and accuracy is specified for assessment criteria. The practice exercises match the instructional activity.

SUMMARY

The Instructional Examples A through F demonstrate that the major difference between an adequate and an inadequate mathematics program is not *what* is taught, but *how* the program is taught. Most mathematics programs will:

1. Have general instructions for teacher presentation.
2. Present mathematics concepts in a logical order.
3. Provide materials for initial instruction.
4. Specify accuracy as a criterion for skill mastery.

An adequate mathematics program will:

1. Have exact instructions for the teacher's presentation.
2. Specify mastery of prerequisite skills before going on to a new more complicated skill.
3. Break-down concepts into workable tasks.
4. Provide materials for both initial instruction and practice.
5. Specify both accuracy and rate as a criterion for skill mastery.

PRACTICE MATERIALS

Practice materials for mathematics programs are most frequently listed as supplementary or reinforcement exercises. They are presented to the student in the form of workbooks or dittoed worksheets. Publishers usually include such supplementary materials with basic texts. Quite often teachers who are dissatisfied with the quantity or quality of these supplementary materials will create their own teacher-made worksheets. Regardless of the source of these materials, the purpose is the same—to provide the student with appropriate and sufficient drill in basic math skills which have already been taught.

Mastery of Basic Math Skills

Knowledge of basic number combinations in addition, subtraction, multiplication, and division is fundamental to the development of proficiency in all areas of mathematical computation. Development of these skills must be to a degree of mastery that will assure their functional use and permanent retention. In a task such as basic number combinations, where the only limitations on response rate are within or under the control of the person responding, the best indicator of proficiency of that skill is a combination of accuracy and rate of response.

CRITICAL ELEMENTS

To analyze practice materials for mathematics, ask yourself the questions listed below for the four critical elements: response, stimulus, assessment, and practice. Notice that the questions listed under practice are concerned only with the quality and quantity of practice provided.

Response

1. What observable behavior is required for the skill?
2. Is the student required to say it, write it, or make it?
3. What observable behavior is required for the skill practiced on this page?
4. Is the response the same as the skill statement?

Stimulus

1. What stimulus is required for the response?
2. What stimulus is provided on the student's page?
3. Is the stimulus the same as in the skill statement?
4. Is a correction procedure specified in the teacher's guide?

Assessment

1. Are mastery criteria specified?
2. Are the assessment procedures the same as in the Instructional Planning Sheet for Mathematics?

Practice

1. Does the practice provided appear to be sufficient?
2. Are the practice stimuli and responses the same as in the skill statement?

INSTRUCTIONAL EXAMPLES

Material G—Addition

$$8+2=\square$$

$$\begin{array}{r}6\\+\,3\\\hline\end{array}$$

$$\begin{array}{r}7\\+\,1\\\hline\end{array}$$

$$2+2=\square$$

$$4+4=\square$$

$$\begin{array}{r}5\\+\,3\\\hline\end{array}$$

Stimulus:	Single digit addition problems written in the forms: $5+1=$ or $\begin{array}{r}5\\+\underline{1}\end{array}$
Response:	Writes the sum for each problem.
Assessment:	Writes the answers at a rate of 40 digits per minute with 100 percent accuracy.
Practice:	Several worksheets with the same type of stimulus-response items as above.

Practice Exercise 16

1. **Material for initial instruction included objectives and instructions for the teacher. Write a brief explanation of why these are not included in the practice materials.**
2. **Material G is an example of an adequate practice material. In a written summary, state the reason why. You will want to refer to the addition subtopic on the Instructional Planning Sheet for mathematics.**

Analysis of Material G. (1) Objectives and instructions serve as guidelines for initial instruction. Practice materials are appropriate only after the concept or skill has been introduced to the student. (2) The stimulus-response items meet the requirements specified on the Instructional Planning Sheet. The assessment criteria specifies both accuracy and rate. The practice exercises match the skill statement. Several of these worksheets would provide a sufficient quantity of practice materials.

Material H—Addition

6 + 3 = ☐

7 + 1 = ☐

4 + 4 = ☐

2 + 4 = ☐

5 + 3 = ☐

6 + 1 = ☐

Stimulus:	Single digit addition problems written in the form: 5 + 2 =
Response:	Writes the sum for each problem.
Assessment:	Writes the answers with 100 percent accuracy.
Practice:	Several worksheets with the same type of stimulus-response items as above.

Practice Exercise 17

Circle Yes or No

Material H is an example of an inadequate practice material. Explain why. **Yes No**

____

____

____

Analysis of Material H. Material H is inadequate. Although the stimulus-response items meet the requirements specified on the Instructional Planning Sheet, the assessment procedure specifies criteria for accuracy only—an insufficient criteria for practice materials.

Practice Exercise 18

Review

Two charts, Determining Rate and Accuracy and Establishing Minimum Performance, are presented on pages 44 and 45. You will need to refer to these charts to complete the following exercise:

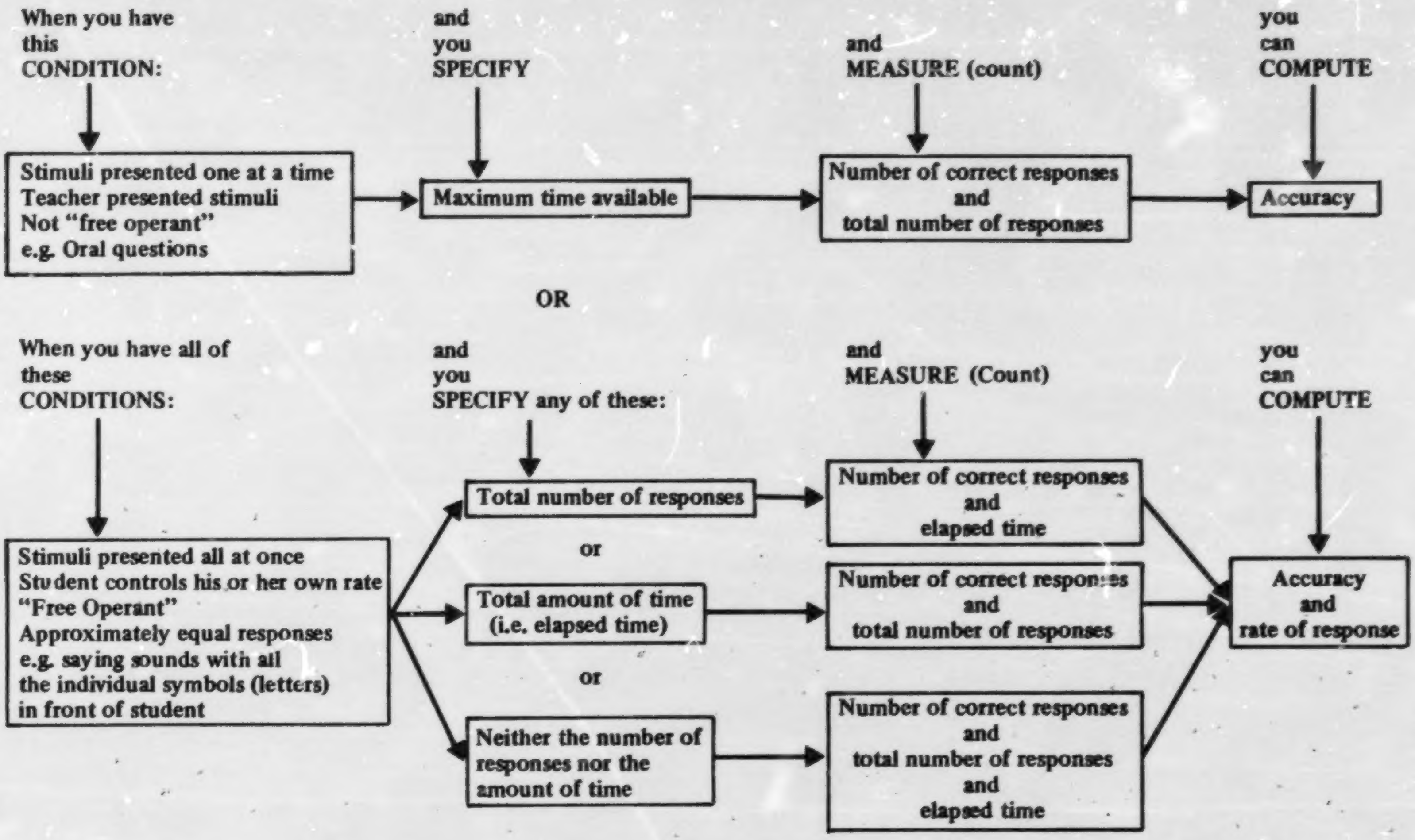
A teacher plans to prepare practice materials for addition equations with sums of 5 or less. The student will demonstrate mastery by writing the answers to the equations which are presented in the form 2 + 3 = ☐

1. **Specify the type of condition under which the teacher should present the materials.____**
   ____
2. **Fill in the blanks:**
   The teacher will record the total number of responses and/or elapsed time and__________
3. **List the measurements which the teacher will compute.**
   (a) ____________________________
   (b) ____________________________
4. **State the minimum performance for accuracy which the teacher should require. State your reason why.______________**
5. **Write a brief description of how the teacher should determine the minimum acceptable rate.________________________**

Answer to the Review Practice Exercise 18

The teacher should present the material all at once so that the student may control his or her own rate. Total number of responses and/or elapsed time and the number of correct responses will be recorded. The teacher will need to compute both accuracy and rate. A minimum of 100 percent accuracy should be set because single digit addition is a basic skill. The minimum acceptable rate should be determined by the rate measurement of a skilled student.

DETERMINING RATE AND ACCURACY


When you have this CONDITION:
and you SPECIFY
and MEASURE (count)
you can COMPUTE
Stimuli presented one at a time
Teacher presented stimuli
Not "free operant"
e.g. Oral questions
Maximum time available
Number of correct responses and total number of responses
Accuracy
OR
When you have all of these CONDITIONS:
and you SPECIFY any of these:
and MEASURE (Count)
you can COMPUTE
Stimuli presented all at once
Student controls his or her own rate
"Free Operant"
Approximately equal responses
e.g. saying sounds with all the individual symbols (letters) in front of student
Total number of responses
or
Total amount of time (i.e. elapsed time)
or
Neither the number of responses nor the amount of time
Number of correct responses and elapsed time
Number of correct responses and total number of responses
Number of correct responses and total number of responses and elapsed time
Accuracy and rate of response

ESTABLISHING MINIMUM PERFORMANCES

ACCURACY: Require 90-100 percent correct for Process and Concept Skills, of which only a random sample of the possible stimuli will be tested. Require 100 percent correct for Basic and Prerequisite Skills, of which every stimulus will be tested.

RATE OF RESPONSE: Set the minimum acceptable rate at the measured rate of a skilled student. Adjust this rate upward or downward as indicated by the performance of the nonskilled students.

EXAMPLE	MINIMUM PERFORMANCE	
	Rate of Response	Accuracy
Saying the sounds of letters on 40 cards, all of which are laying on a table in front of the student.	120 correct per minute	100% correct
Writing the name of a mammal beneath its picture in a page having 30 pictures of different mammals.	6 correct per minute	90-100% correct
Writing a gramatically correct sentence with each of the 10 words written on the board.	1 correct per minute	90-100% correct
When asked to by the teacher, the student counts to 100 by 2's.	60 correct per minute	100% correct

Assignment 8

DIRECTIONS

1. Analyze a mathematics textbook on one of the following topics.
   - Reading numerals
   - Writing numerals
   - Rational counting
   - Addition
   - Subtraction
   - Multiplication
   - Division

   a. Read the skill statements on the Instructional Planning Sheet for the topic chosen.

   b. Read the pages in the teacher's guide which cover the instructions for teaching the topic.

   c. Examine the pages in the student textbook which provide instruction and practice on the topic.

2. On the response form for Analyzing and Adapting Instructional Materials complete the analysis section for each of the mathematics subtopics.

   You have been provided with duplicate copies of the three response forms used for analyzing and adapting instructional materials. Send one copy to the address on page 6.

   Keep one copy for your own records.

   a. Fill in the information at the top of the sheet.
      - —Material being analyzed
      - —Publisher
      - —Publication date

   b. Fill in the skill statement (stimulus, response) for each of the subtopics to be analyzed.

   c. Write in the page numbers read for your analysis of each of the subtopics.

   d. Write a brief description of the response, stimulus (i), assessment, and practice which are contained in the material.

   e. Include an analysis for each of the procedures used in the instructional materials to teach each of the subtopics related to the topic.

CRITERIA

In order to complete all references to a topic on your Instructional Planning Sheet, it may be necessary to analyze more than one level of the instructional materials.

A completed response form for Analyzing and Adapting Instructional Materials will include the following information for each of the mathematics subtopics.

1. A description of the materials should specify the following for each of the four elements:

RESPONSE

a. What observable behavior is required for the skill?

b. What is the student required to do? Does he or she say it, write it, make it, circle it, cross it out, etc.?

STIMULUS

a. Is the stimulus specified in the teacher's guide?

b. What stimulus is provided on the student's page?

ASSESSMENT

a. Does the teacher's edition or the student's test specify procedures for initial placement and measurement of daily progress.

b. Is a mastery criteria specified? Is it appropriate? Is it sufficient?

PRACTICE

a. Is practice provided?

b. Does the practice provided appear to be sufficient? Is there enough practice to insure that the student will be able to demonstrate mastery of the particular skill?

c. Are the practice stimuli and response the same as those specified in the skill statement?

Assignment 9

1. Use the terms (adequate, inadequate, stated, not stated, etc.) under each heading (Response, Stimulus, Assessment, and Practice) and write an evaluation of the material analyzed in Assignment 8.
2. Use the information from your analysis of instructional materials and make the necessary adaptations so that your materials will meet the requirements specified for each of the mathematics topics on the Instructional Planning Sheet.
   a. Write a brief description of the changes you need to make under each of the headings, Response, Stimulus, Assessment, and Practice.
   b. Make the materials for two of the sub-skills which you will need for the adaptations (changes) you have described on the response form for Analyzing and Adapting Instructional Materials. Send a sample of each of the materials you make for your adaptations.

CRITERIA

Adaptations of the materials should include the following:

Response

a. The response is observable, verifiable, and measureable.

Stimulus

a. The stimulus is appropriate for the response called for.

Assessment

a. The initial instruction specifies accuracy as a measurement.
b. Assessment for practice of skills specifies both accuracy and rate as a measurement of mastery.

Practice

a. The stimulus-response items called for in the practice materials match the stimulus-response items from the instruction.

3. A description of the adaptation should state the types of changes which are necessary so that the instructional materials will meet the specifications listed on the Instructional Planning Sheet for each of the subtopics listed under the topic. The description of the adaptations should include:
   a. The necessary deletions
   b. The necessary additions

Selecting Instructional Materials

The term *select* has two meanings: (1) selecting material to be purchased, and (2) selecting the most appropriate portions of the material that you have available. Classroom teachers *select* material every day when they plan instruction. Therefore, the primary emphasis on *selection* will be with those materials you are using.

In the first two sections of this text, we analyzed instructional materials focusing on the four critical elements–*response*, *stimulus*, *assessment*, and *practice*. Based upon the analysis of the instructional materials, the necessary adaptations were made.

Selection of instructional materials involves the analysis and adaptation of materials, plus one further consideration–what is the cost in terms of the time and the material needed to make the necessary adaptations.

SELECTION PROCEDURE

A general screening of materials, which you may consider for purposes of instruction, should begin with:

1. *A description of the students for whom you are selecting* materials.

   Are they poor readers, nonreaders, beginning readers; primary, secondary, or middle graders, etc.?
2. *Specification of how the materials are to be used.*

   Is the material needed for basic instruction in reading, language, mathematics, science, or social studies?

   Is the material needed to provide extra practice?

Materials which will not meet the needs of your students should not be considered during a formal screening procedure. Limiting your formal screening to three instructional materials will make the task manageable and less time consuming. Completing the response form, ***Selecting Instructional Materials***, for each of the programs which have passed the general screening will provide you with some objective information upon which you can make your selection decisions.

Practice Exercise 19

Briefly describe the procedure for a general screening of materials.____________________

____

____

____

The correct answer is:

Describe the skill level of the students for whom you are selecting materials. Specify if the material is to be used for basic instruction or for practice.

FORMAL SCREENING PROCEDURES

1. Analyze three instructional materials.
   a. Write a skill statement for each of the areas for which you need to make a selection decision.
   b. Read the pages in the teacher's guide which cover the instructions for teaching each of the skills.
   c. Examine the pages in the student materials which provide instruction and practice on each of the skills listed.
2. On the response form for Selecting Instructional Materials, complete the analysis section for each of the skills listed.
   a. Fill in the information at the top of the sheet.
      –material being analyzed
      –publisher
      –publication date
   b. Write in the page numbers from both the teacher's guide and student materials which are read for the analysis of each of the skills.
   c. Write a brief description of the response, stimuli, assessment, and practice which are contained in the material.

   d. Use the terms (adequate, inadequate, stated, not stated, etc.) under each heading (Response, Stimulus, Assessment, and Practice) and write an evaluation of the material.

3. Use the information from your analysis of instructional materials and describe the adaptations necessary so that your materials will meet the requirements specified for each of the skill statements.
   a. Write a brief description of the changes you need to make under each of the headings–(Response, Stimulus, Assessment, and Practice).
4. Estimate the cost of the materials needed and approximate the time it would take to make the necessary adaptations.
   a. Write in the estimated cost of materials in the appropriate column.
   b. Write in the approximate amount of time it would take to make the materials.

After completing the formal screening, compare the cost of adapting materials for each of the programs. The program which will cost the least to adapt will be the one which is most responsive to the needs of the student and the teacher.

Practice Exercise 20

Write a summary of the formal screening procedures for selecting instructional materials.___

____

____

____

____

____

Your answer shou[illegible]ude the following points for a formal screen[illegible]cedure:

1. Begins with the analysis of instructional materials.
2. Recommendations for changes (adaptations) are based upon the information from the analysis of materials.
3. The teacher estimates the cost of adaptations in terms of materials needed and the time it takes for the teacher to make the materials.
4. The program selected is that program which "costs" the least to adapt.

Assignment 10

DIRECTIONS

1. Transfer the information from the completed response form for *Analyzing and Adapting Instructional Materials* (Assignment 3) to the response form for Selecting Instructional Materials (page 83). This can be a Xerox or carbon copy which you paste or tape over the appropriate section of the selection form.
2. Estimate the cost of the materials needed and approximate the time it would take to make the necessary adaptations.
    a. Write in the estimated cost of materials in the appropriate column.
    b. Write in the approximate amount of time it would take to make the materials (adaptations).
3. Analyze and adapt a second reading series following the procedure specified in Assignments 3 and 4. Record your analysis and adaptations on the *Selecting Instructional Materials* response form. Then follow the procedures outlined above in Item 2, Assignment 10.
4. Estimate the cost of the materials needed and approximate the time it would take to make the necessary adaptations.
    a. Write in the estimated cost of materials in the appropriate column.
    b. Write in the approximate amount of time it would take to make the materials (adaptations).
5. Compare the cost of adapting materials for each of the programs. Write a short summary telling which program you would select and why.

CRITERIA

A completed response form for Selecting Instructional Materials will include the following information for each of the decoding skill statements.

1. A description of the materials should meet the criteria for each of the four elements as specified on page 10.
2. A description of the adaptations should state the types of changes which are necessary so that the instructional materials will meet the specifications listed on the Instructional Planning Sheet for the particular skill. The description of the adaptations should include:
    a. The necessary deletions.
    b. The necessary additions.
3. Estimated costs should include:
    a. A description of the materials and their monetary value.
    b. A rough calculation of the number of hours (teacher, aides, volunteers) it will take to make the materials.
4. A written summary of the selection decision you would make should logically follow from and be based upon the formal screening procedures.

Developing Instructional Materials

WHEN TO DEVELOP

Since the development of an educational product is time-consuming, your decision to develop or not to develop should be determined by this basic rule: Develop material only for those critical skills that are taught frequently and for which adequate material is not available. If you do not intend to make extensive use of a product, it is probably not worth your time and effort to develop it.

STEPS IN DEVELOPING INSTRUCTIONAL MATERIAL

The first three steps that you follow in developing instructional material are similar to the steps described in "Instructional Planning." Step 4 deals primarily with classroom management techniques. Steps 5 through 10 involve a tryout-revision cycle.

PROCEDURES FOR DEVELOPING INSTRUCTIONAL MATERIALS

1. Select the subject area.
2. Specify the range of skills to be covered.
3. Construct or obtain instructional materials for each step.
4. Develop a management system.
5. Try out the program.
6. Keep track of pupil performance on each step.
7. Revise the program at points of difficulty.
8. Try out the revised program.
9. Have other teachers try out the program.
10. Make final revisions if necessary.

Do Practice Exercise 21 now.

EXPLANATION OF STEPS IN MATERIALS DEVELOPMENT

1. Select the Subject Area

Choose a subject area for which you would like to develop materials. Remember the rule of thumb–develop materials only for those critical skills that are taught frequently and for which adequate material is not available.

2. Specify the Range of Skills to be Covered

a. What is the terminal skill? State it.
b. Are there prerequisite skills to be covered? If so, state them.
c. List each step, in sequence, required to master the terminal skill (teaching sequence).
d. For each step (in C) specify the following:
   –Responses required of the pupil
   –Stimulus (i) presented to get the response
   –How mastery will be determined (Assessment Procedures).
      –Specify the criteria for mastery.
      –State how performance is to be measured.
      –Include whatever assessment materials are needed.

3. Construct or Obtain Instructional Materials for Each Step

Decisions as to whether to make or buy the instructional materials are made at this time.

4. Develop a Management System

The management system should include:

a. Record keeping
      –Daily performance on specific skills.
      –Mastery of each skill and progress through the sequence of skills.
b. Daily procedure for pupils
      –sequence of activities
      –instruction
      –practice
      –measurement of performance
      –reinforcement
c. Storage and retrieval of materials.

5. Try Out the Program

Try out the first draft of the material on a small group of students. After you have determined the specifications for Steps 1 through 4, you are ready to prepare the first draft of the material. Don't spend a lot of time or money attempting to produce a polished product at this point. Keep it simple. Remember, you may have to throw it out after the first tryout!

Practice Exercise 21

1. The first step in materials development is the selection of a subject area. What is the rule of thumb in choosing a subject area for program development? Write your answer: ______________________________

____

____

____

2. In the space below list the first four steps for developing instructional materials (in sequential order).

a. ______________________________
b. ______________________________
c. ______________________________
d. ______________________________

Answers to Practice Exercise 21

1. Develop materials only for those critical skills that are taught frequently and for which adequate material is not available.
2. The four steps for developing instructional materials are:
    - a. Select the subject area.
    - b. Specify the range of skills to be covered.
    - c. Construct or obtain materials for each step.
    - d. Develop a management system.

6. Keep Track of Pupil Performance on Each Step

Select a small group of students for whom the product is intended. As you work with the students, focus on their responses. Are they the same as you specified? Can the students follow the directions? Are the directions clear or confusing? Look at the performance data. Think about all the related elements, i.e. response, stimulus, assessment, instruction, and practice. Do you see any problems with these elements? Take notes on the first tryout and be ready to make the first revisions.

You will want your methods of data collection to be as specific and accurate as possible. Refer to the measurement chart on page 54 to verify that you are using an appropriate measure for each skill.

7. Revise the Program at Points of Difficulty

Revise the material on the basis of the data that was collected on the first tryout. Make all the necessary revisions. Again, keep them simple. Plan to make more revisions until your product teaches what it was designed to teach.

8. Try Out the Revised Program

Try out the revised program on a small group of students. Once again you will want to keep track of student performance on each step.

9. Have Other Teachers Try the Program

Ask other teachers to use the program you have developed with a small group of students. Request that they keep accurate student performance data and make recommendations for further revisions based on the data.

10. Make Final Revisions if Necessary

Based upon the feedback you get from other teachers and your own performance data, make any final revisions deemed necessary.

Practice Exercise 22

During the tryout/revise cycle (Steps 5 through 9), on what type of information should revisions be based?

____

____

Answer to Practice Exercise 22

Revisions should be based upon performance data.

SOME IMPORTANT POINTS

1. Don't tackle too big an area to start with.
2. Be sure the steps are small enough for individualized instruction. Determine size by the instructional time required to teach the skill so the pupil can practice independently.
3. Be sure that practice materials require the same kind of responses as the terminal skill.
4. Be sure performance criteria are adequate. In case of doubt, it is better to set criteria too high rather than too low.
5. Be sure the motivation and reinforcement system is strong enough to rule out poor performance due to lack of effort.
6. Be sure to provide adequate drill and practice.

MEASUREMENT CHART

TYPE OF MEASURE	HOW EXPRESSED	NECESSARY CONDITIONS FOR USE	APPROPRIATE USE
1. Accuracy	Usually in percent or ratio of correct responses to total responses.	Precise criteria for correct and incorrect must be specified. Each response must be scorable as correct or incorrect.	During the initial acquisition of learning, i.e. presentation of new stimuli calling for previously unknown responses. As a necessary criterion for all other measures. Where simplicity is desired.
2. Time	In minutes, seconds, hours, etc.	The same task must be correctly performed on repeated trials.	Wherever the same task is being performed on repeated trials such as: running the 100-yard dash, writing answers to the same set of multiplication facts, reciting the alphabet, etc.
3. Rate of response	In responses per unit of time.	Behavior being measured must be a free operant. Responses should be of equal or approximately equal difficulty. Responses must be defined so that a high reliability in measuring occurs. Each response must have a discrete beginning and ending point.	Particularly useful in measuring associative learning where rote, automatic response is required. Useful in measuring performance on skills where a high (or controlled) rate of response is a necessary part of the skill.
4. Trials to criterion	Usually expressed in cumulative responses.	A trial must be precisely defined. Correct reponse criteria must be precisely defined.	If normative data on skill acquisition is desired. Particularly useful for evaluating instructional programming.
5. Magnitude of response (physical measurements)	In physical measures such as amount, weight, distance, height, etc.	The necessary measuring devices must be available. The responses must be identical on repeated trials	In a school setting this measure would be most useful in measuring physical skills and motor responses where the criteria for rate measurement do not apply.
6. Reaction time	In elapsed time between presentation of stimulus and completion of response.	Precise measuring equipment must be available. Usually must be electronic and/or automated so that presentation of stimulus activates timer.	Limited use in the classroom; can be used for measuring reaction times in some athletic events or in driving simulation.

SUMMARY

It is not the purpose of this unit to train teachers to become product developers. Development of major instructional programs such as a reading or mathematics series is a complex undertaking. It requires the full-time efforts of a trained product development team, a substantial financial investment, and enough time to complete several tryouts and revisions. Since 1960, major efforts to develop and validate instructional products have provided teachers with a greater range of choices in effective material. As a wise consumer, a teacher should recognize the essential characteristics of a well developed educational product.

Assignment 11

***This assignment is optional.* It is provided for those teachers who would like to develop an instructional program and have it critiqued. Due to time considerations, you are requested to send a copy of the materials to the address on page 6 after completing Step 4, rather than after Step 9, which would normally be the more logical and preferable time.**

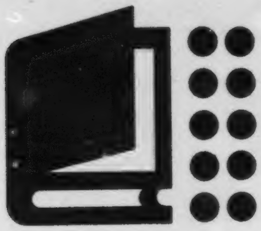
DIRECTIONS

1. **Follow Steps 1 through 4 as outlined on the preceeding pages.**
2. **Before you try out the program (Step 5), send a copy of the program you have developed to the address listed on page 6.**

CRITERIA

1. **The subject area for which you are developing materials should be:**
   - a. **Taught frequently.**
   - b. **Lacking a selection of adequate commercial materials.**
2. **The range of skills should be specified:**
   - a. **The terminal skill is stated.**
   - b. **Prerequisite skills to the unit of instruction are stated.**
   - c. **Steps required to master the terminal skill must be sequenced.**
   - d. **For each step listed in the teaching sequence, the Response, Stimulus, and Assessment procedures must be specified.**
3. **The materials needed should be constructed. You will need to pay both the forwarding and return postage for sending these materials.**
4. **The management program should include:**
   - a. **A record keeping system for keeping track of:**
     - **—student daily performance on skills**
     - **—mastery of skills and progress**
   - b. **A daily procedure for pupils to follow.**
   - c. **A system for storing and retrieving materials.**

Cover Sheets for Assignments



Name:

School:

Date:

Assignment 1–Instructional Materials

Completed Response Form
for Reading Mastery

Name:

School:

Date:

Assignment 2–Instructional Materials

Test results of *Reading Mastery Program* pupil assessment.

Met criteria: Yes No

SEND IN AFTER COMPLETING ASSIGNMENT 6

Name:

School:

Date:

Assignments 3 and 4–Instructional Materials

1. Completed response form for Analyzing and Adapting Reading Materials.
2. Materials for two of the sub-skills.

Met criteria: Yes No

SEND IN AFTER COMPLETING ASSIGNMENT 6

Name:

School:

Date:

Assignment 5–Instructional Materials

1. A written instructional procedure for teaching one of the decoding skills.
    - a. A description of the methods used for teaching unknown skills.
    - b. Practice procedures specified.
    - c. Methods for measuring daily progress.

Met criteria: Yes No

SEND IN AFTER COMPLETING ASSIGNMENT 6

Name:

School:

Date:

Assignment 6—Instructional Materials

1. A copy of the management plan, including whatever graphs or charts are used.

Met criteria: Yes No

SEND IN WITH COMPLETED ASSIGNMENTS 2, 3, 4, and 5.

Name:

School:

Date:

Assignment 7–Instructional Materials

1. A copy of the records of student performance.
2. Any revisions made.

Met criteria: Yes No

TO BE COMPLETED AFTER ASSIGNMENT 6 IS RETURNED

Name:

School:

Date:

Assignments 8 and 9–Instructional Materials

1. Completed response form for Analyzing and Adapting Mathematics Materials.
2. Materials for two of the sub-skills.

Met criteria: Yes No

Name:

School:

Date:

Assignment 10—Instructional Materials

1. Two completed response forms for Selecting Instructional Materials.
2. Short summary of selection decision.

Met criteria: Yes No

Name:

School:

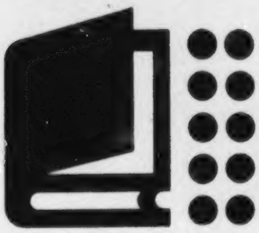
Date:

Assignment 11 (optional)–Instructional Materials

1. Copy of teacher developed instructional materials.

Met criteria: Yes No

Sample Forms



READING MASTERY PLACEMENT TEST RECORDING FORM

Student's name	Unit A Criteria: 120 sounds per minute	Unit B Criteria: 60 words per minute	Unit C Criteria: 120 words per minute

Write the lesson number indicating the unit where the student does not meet the criteria. This is where you begin instruction.

ANALYZING AND ADAPTING INSTRUCTIONAL MATERIALS

Materials:
Publisher:
Publication date:

Subject area:
Topic:

Skill statement:
Stimulus:
Response:

	Analysis		Adaptation
Stimulus		sufficient insufficient	
Response		sufficient insufficient	
Assessment		sufficient insufficient	
Practice		sufficient insufficient	

SELECTING INSTRUCTIONAL MATERIALS

Material:

Publisher:

Publication date:

Subject area:

Topic:

Completed by:

Skill statement:

Stimulus:

Response:

Stimulus			
Response			
Assessment			
Practice			

	Materials	Teacher time
Cost		

STUDY GUIDE FOR READING MASTERY

Begin your study of this program by reading the Teacher Handbook. You are to complete each of the study questions listed. There are several different types of responses called for, such as item completion, filling in the blank, etc.

Program Organization

Write the answer:

1. Each lesson of this program has three units. Briefly describe what is contained in each of these units.

Unit A contains: ____

____

Unit B contains: ____

____

Unit C contains: ____

____

Fill in the blanks:

2. Lesson 1 requires the student to learn ________ sound(s) and ________ irregular word(s).

3. With the exception of Lessons 1, 6, and 38, all of the lessons contain ________ new sound(s), ________ irregular word(s), lists of all additional ________ words, and ________ made from the words introduced in this and previous lessons.

Circle the answer and fill in the blanks:

4. The silent "e," which has an/has no effect on the pronunciation of other vowels is represented by the symbol ________

Write the answer:

5. The letter "c" has two sounds in English. What are they? ______________________________

Which is more common? ______________________

Circle the answer:

6. The hard/soft "g" sound is taught as irregular since its frequency of occurrence is very low.

Fill in the blanks:

7. The most frequent sound for the letter "y" is ______________________________.

8. The dash in the "–y" sound is to indicate that ______________________________.

9. The vowel sounds of "ī" and "i" for "y" are not presented and should be learned as ______________________.

10. The presentation of a vowel followed by a dash then "e" indicates that ______________________.

Fill in the blanks:

11. The student response to the symbols "ci" and "ce" should be ______________________.

12. The sound for "ow" in this program is as in the word ______________________.

13. The symbol "ie" has two sounds in this program; the ______________ and the ______________. The sound of ______________, however, occurs twice as frequently; therefore, it may be helpful for the learner to be informed that ____

____

14. The symbol "y–" represents that consonant/vowel sound of "y."

15. The symbol "eigh" stands for the sound of ______________ in this program.

PROGRAM COMPONENTS

Fill in the blanks:

16. List the four components contained in the Reading Mastery Program.

   a. ____
   b. ____
   c. ____
   d. ____

Mastery Criteria

17. Complete each of the following statements:

   a. The mastery criteria for reading sounds and words in Unit A are ______________________

   ____.

   b. The mastery criteria for reading words presented in lists (Unit B) are ______________________

   ____.

   c. The mastery criteria for reading the sentences contained in Unit C are ______________________

   ____.

Instructional Procedures

Fill in the blanks:

18. For initial assessment of the student's reading skills, list the materials needed:

   a. ____
   b. ____
   c. ____.

19. **Write a brief description of the procedures for initial placement.**

20. Describe the procedure for presenting (teaching) new sounds as prescribed in Reading Mastery.

21. Describe the procedure for presenting (teaching) irregular words.

Drill and Practice Activities for Sounds and Irregular Words

Circle the correct answer.

22. All of the recommended drills for practicing sounds and irregular words state that the student should practice orally/silently.

23. Write out the procedures for at least two of the drills and practice activities.

Complete each of the following:

24. "Blending" as defined in Reading Mastery is ______________________________

25. The mastery criteria for the two sound and the three sound drill are ______________________________

26. Describe the procedures for the two sound drill. What is the purpose of this particular drill? ______________________________

27. What is the purpose of the regular word and nonsense word drill with the teacher? Briefly describe the procedure entailed in the drill.

____

Circle the answer.

28. On the regular word and nonsense word drill with the teacher each word must be/need not be pronounced correctly.

Write the answers.

29. Materials which are used for Oral Reading (Unit D) should have four characteristics. List each one below.

a. ______________________________

b. ______________________________

c. ______________________________

d. ______________________________

Fill in the blanks.

30. The best guide for determining oral reading grade level (Unit D) is to try the student with graded material and select that which he or she can read with fluency (approximately __________ words per minute, with __________ percent or less errors.

Fill in the blanks.

31. In Lesson 36 the student is introduced to ____
and to ____.

ANSWER KEY TO
STUDY GUIDE FOR READING MASTERY

Begin your study of this program by reading the Teacher Handbook. You are to complete each of the study questions listed. There are several different types of responses called for, such as item completion, filling in the blank, etc.

Program Organization

Write the answer:

1. Each lesson of this program has three units. Briefly describe what is contained in each of these units.

Unit A contains: *A list of all of the sounds. The sound in parentheses is the new sound for that lesson. Also contained in Unit A is one irregular word to be learned in the same manner as the sound.*

Unit B contains: *Lists of words and nonsense words mixed together.*

Unit C contains: *Sentences made up of words from the lists in Unit B and the irregular words from Unit A.*

Fill in the blanks:

2. Lesson 1 requires the student to learn *five* sound(s) and *one* irregular word(s).

Fill in the blanks:

3. With the exception of Lessons 1, 6, and 38, all of the lessons contain *one* new sound(s), *one* irregular word(s), lists of all additional *regular* words, and *sentences* made from the words introduced in this and previous lessons.

Circle the answer and fill in the blanks:

4. The silent "e" which has an/[✓ has no] effect on the pronunciation of other vowels is represented by the symbol *ɇ*.

Write the answer:

5. The letter "c" has two sounds in English. What are they? *"k" and "s"*
Which is most common? *"k" as in cat, the other sound is "s" as in city.*

Circle the answer:

6. The hard/[✓ soft] "g" sound is taught as irregular since its frequency of occurrence is very low.

Fill in the blanks:

7. The most frequent sound for the letter "y" is *ē*.

8. The dash in the "-y" sound is to indicate that *it is the final letter in the word*.

9. The vowel sounds of "ī" and "i" for "y" are not presented and should be learned as *irregular*.

10. The presentation of a vowel followed by a dash then "e" indicates that *the vowel is long*.

Fill in the blanks:

11. The student response to the symbols "ci" and "ce" should be *"s"*.

12. The sound for "ow" in this program is as in the word *cow (or any word where ow has the same sound)*.

13. The symbol "ie" has two sounds; the *ī* and the *ē*. The sound of *ē*, however, occurs twice as frequently; therefore, it may be helpful for the learner to be informed that *if the long ē does not sound correct, the long ī should be tried*.

14. The symbol "y–" represents that [✓ consonant]/vowel sound of "y."

15. The symbol "eigh" stands for the sound of *"ā"* in this program.

Program Components

Fill in the blanks:

16. List the four components contained in the Reading Mastery Program.
    a. *Student card sets. There are 121 cards to a set.*
    b. *Student's Handbook. This provides instructional materials for Units B and C. It also includes student rate tables.*
    c. *Teacher's Handbook.*
    d. *Dictionary Skills Mastery Program*

Mastery Criteria

17. Complete each of the following statements:
    (1) The mastery criteria for reading sounds and words in Unit A are *120 sounds or words per minute with 100 percent accuracy*.
    (2) The mastery criteria for reading words presented in lists (Unit B) are *60 words per minute with 100 percent accuracy*.
    (3) The mastery criteria for reading the sentences contained in Unit C are *120 words per minute with 100 percent accuracy*.

Instructional Procedures

Fill in the blanks:

18. For initial assessment of the student's reading skills list the materials needed:
    (1) *Set of student cards.*
    (2) *Student Handbook.*
    (3) *Stopwatch or other accurate timing device.*

19. Write a brief description of the procedures for initial placements.

a) The teacher says, "I AM GOING TO SHOW YOU SOME CARDS WITH LETTERS OR WORDS PRINTED ON THEM. FOR EACH CARD, SAY THE CORRECT SOUND OR WORD AS QUICKLY AS YOU CAN." b) T presents cards numbered 1s to student. If student responds correctly to each card within 2 seconds per card, then teacher presents card 1w. c) If the student responds correctly to each card for Lesson 1 within the allotted time, T presents the Unit B from Lesson 1. d) If the student responds to all the words in Unit B at a rate of 60 per minute, the teacher presents the sentences in Unit C. e) If the student correctly reads all of the sentences at a rate of 120 words per minute, then the teacher goes to the next lesson and repeats the same procedure. f) This procedure is followed with each succeeding lesson until the student fails to meet criteria on any unit. The lesson on which the student fails to meet criteria is the lesson on which he or she begins instruction.

20. Describe the procedure for presenting (teaching) new sounds as prescribed in Reading Mastery.

a) The teacher shows the student the new sound. The teacher says the new sound and asks the student to repeat it. The teacher confirms that this is the correct sound and asks the student to repeat it several times. b) If the student repeats the sound incorrectly, the teacher models the sound again and asks the student to repeat it. This procedure is continued until the student can produce the sound correctly. c) When the correct sound is emitted on several trials without T modeling, T randomly selects 4 or 5 other cards from the set which S is currently using and adds the new sounds to them-S is to read all of the sounds. d) The new sound is added to the student's current set. The student practices all his or her sounds each day and is timed on oral reading of all the sounds.

21. Describe the procedure for presenting (teaching) irregular words.

The procedure for presenting (teaching) irregular words is exactly the same procedure used for teaching sounds.

Drill and Practice Activities for Sounds and Irregular Words

Circle the correct answer.

22. All of the recommended drills for practicing sounds and irregular words state that the student should practice [✓ orally]/silently.

23. Write out the procedures for at least two of the drills and practice activities.

Check your procedures with those listed in the Teacher Handbook. Make sure that all critical points have been included.

Complete each of the following:

24. "Blending" as defined in Reading Mastery is *The process of saying sounds without any pause between the sounds. At the precise instant the speaker stops saying one sound, he or she begins saying the next.*

25. The mastery criteria for the two sound and the three sound drills are *60 groups per minute with 100 percent accuracy*

26. Describe the procedures for the two sound drill. What is the purpose of this particular drill? *a) Sound cards for all lessons up to and including the current lesson should be used. b) The student lays the sound cards out on the table in pairs. c) The student orally reads each pair of sounds until he or she says them without a pause between the sounds. The purpose of this drill is to teach the student how to blend.*

27. What is the purpose of the regular word and nonsense word drill with the teacher? Briefly describe the procedure entailed in the drill.

To provide closely supervised practice for the student. The critical points of the procedure are: a) The teacher points to randomly selected words from the word list(s). The student says each word which is pointed to. b) If the student responds correctly to each word in a sample of 15 to 25 percent of the words, the drill is terminated. c) If the student makes errors in pronunciation of the words, the teacher models pronunciation. The student imitates pronunciation. Practice continues until the student reads words correctly.

Circle the answer.

28. On the regular word and nonsense word drill with the teacher, each word [✓ must be]/need not be pronounced correctly.

Write the answers.

29. Materials which are used for Oral Reading (Unit D) should have four characteristics. List each one below.

a. *The materials should be designed for use with a phonics or linguistic based program.*

b. *Materials with short selections are preferrable.*

c. *The materials should provide questions concerning the content.*

d. *Selections in which the difficult words are identified and presented separately for study are desireable.*

Fill in the blanks.

30. The best guide for determining oral reading grade level (Unit D) is to try the student with graded material and select that which he or she can read with fluency (approximately *75* words per minute, with *5* percent or less errors).

Fill in the blanks.

31. In Lesson 36 the student is introduced to *oral reading from books* and to *Dictionary study*.